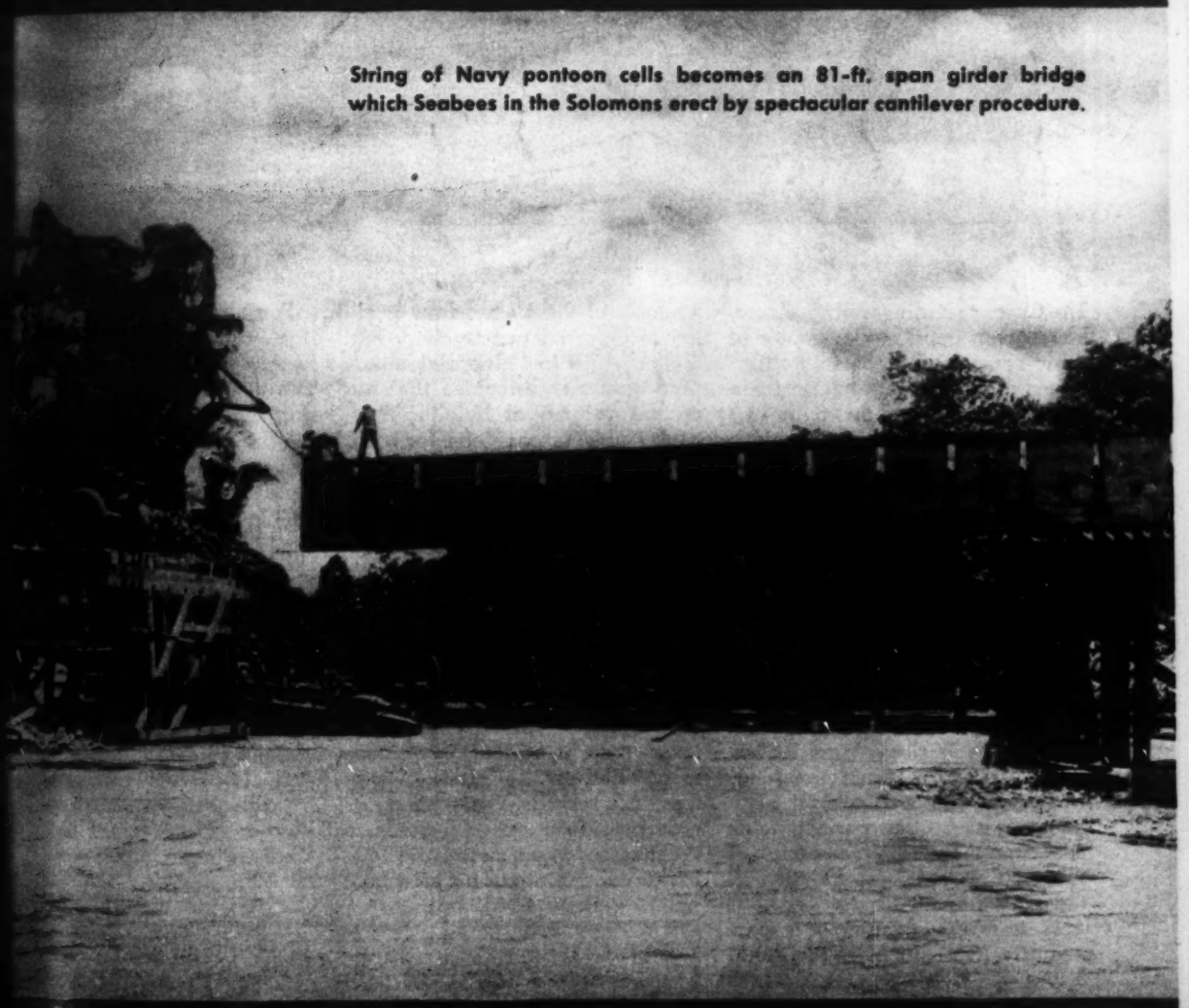
OCT 6 1944

ENGINEERING NEWS-RECORD

OCTOBER 5, 1944



String of Navy pontoon cells becomes an 81-ft. span girder bridge which Seabees in the Solomons erect by spectacular cantilever procedure.

ATION DEVELOPMENTS AT HOME AND ABROAD

The Corps of Engineers, U.S. Army, have given countless examples of their resourcefulness in getting things done . . . and getting them done *right* . . . and this 6400-foot wrought iron water main provides still another.

The line was installed to serve an eastern military establishment. Ten-inch 41# genuine wrought iron was obtained on WW-P-441a Specifications. The pipe was furnished mill welded in double random lengths. A 9-inch long split sleeve, of the same thickness as the pipe material, was located over each weld, drawn up tightly, and welded. Each sleeve was drilled and tapped for a 1-inch pipe plug, so that air pressure could be applied to assure that perfect welds had been made. Field assembly of the pipe sections was handled in the same way.

Waterworks planning is a particularly live subject at this time, because of the tremendous backlog of deferred construction, and the pressure to "blueprint now." One authority estimates that the annual volume of building necessary to take care of needs will run from 2½ to 3½ times the prewar average. The utmost care in selecting material is of course imperative, as otherwise the installations may become a tax-payer's headache.

Water line materials are extremely important, as the pipe is exposed to corrosion both from within and without. Wrought iron has been used for periods of many years, and its ability to resist these conditions is certified by hundreds of performance records. These same records provide a splendid guide to the specifier who aims to avoid gamble or uncertainty in his selection.

For an explanation of wrought iron's durability, you need look no further than its unusual structure. The tiny fibers of glass-like silica slag which are threaded through the high-purity iron matrix, act almost like a "picket fence" in resisting and diffusing corrosive attack. The fibers also help to firmly anchor the initial protective film, which shields the underlying metal.

You will find some helpful and interesting information on wrought iron for water service in our bulletin, "Wrought Iron for Underground Services." May we send you a copy?

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ENGINEERING NEWS-RECORD

...ed to Buildings, Sewers, Waterworks, Bridges, Roads, Dams, Foundations, Earthwork, Flood Control, Public Works, Shipbuilding, Irrigation, Canals, Railroads

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JOHN ABBINK, *Publisher*

WALDO G. BOWMAN, *Editor* ALBERT E. PAXTON, *Manager*

...L 133 OCTOBER 5, 1944 No. 14

...OMING NEXT

...The Special Section on Buildings ...be published in the Oct. 19, issue ...designed to bring together some ...the lessons of the great war pe... ...d of construction so that they may ...put to use, if worthy, on postwar ...jects. Thus the important new ...igns of the past three years are ...ented in an article titled, "These ...ildings Were Significant". The ...t possibilities inherent in extend... ...the architect-engineer collabora..., common to war jobs, to peace... ...e practice are discussed by an ...hitect and by an engineer. Other ...cles will outline the postwar ...cts of emergency specifications ...d the interesting solutions of de... ...problems in the synthetic rub... ...plant program. Finally, Arthur ...Boase, *News-Record's* special edi... ...al representative just back from ...th America, begins a series of ...cles on reinforced concrete design ...th of the border and the lessons it ...ds for us.

...Other articles of special interest ...eduled for the Oct. 19, issue are: ...es for B-29 Superfortress Bomb... ...in India; Jap concrete construc... ...s in the Marshall and Gilbert ...nds; Portable Railway Bridges ...cision Built, and Powered Con... ...e Ships, their design and con... ...ction.

...OKING AHEAD

...Designing asphalt mixtures has ...ays been considered strictly a ...ratory job. However, simplifica... ...of the design, and development ...esign charts now makes field pro... ...ioning a possibility. In an early ...e, L. D. Long of the Newark ...J.) Testing Laboratories will re... ...present methods and discuss in ...il use of the revised design charts ...make rapid proportioning in the ...a reality.

...o permit open-pit mining of iron ...found at the bottom of a 100 to ...ft. deep lake in Canada required ...diversion of a river to a new ...e; emptying the lake by pump... ...and the stripping of millions of ...c yards of overburden from the ...bottom. At least one construc... ...innovation was introduced—the ...of a tunnel on the flow line of the ...diversion channel, for relieving ...oses in rock blasting. The ...e required only half the usual ...nt of explosives and resulted in ...r fragmentation. The project ...e described in an early issue.

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Number of copies of this issue printed: 35,987

DO YOU WANT AN INDEX?

Due to the paper shortage, no index for the volume just completed, No. 132 (January-June, 1944) will be issued except to subscribers who ask for it. If you want a copy of the index please send in the coupon below. The index is now ready for distribution.

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IV	½	0.668	0.20	1.571	.20
V	⅝	1.043	0.31	1.964	.10
VI	¾	1.502	0.44	2.356	Base
VII	⅞	2.044	0.60	2.749	Base
VIII	1	2.670	0.79	3.142	Base

*Plain Round—Not deformed.

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MONTHLY CONSTRUCTION BUSINESS SUMMARY

ENR CONSTRUCTION VOLUME AND NEW PRODUCTIVE CAPITAL

(,000 omitted)	September 1943 (5 wk.)	September 1944 (4 wk.)	% Change†	Nine Months 1943 (39 wk.)	Nine Months 1944 (39 wk.)	% Change
Total U. S. Construction	$264,285	$117,919	−44.0	$2,488,373	$1,379,561	−45.0
Private Construction	46,308	19,561	−47.0	329,590	291,267	−12.0
Public Construction	217,977	98,358	−44.0	2,158,783	1,088,294	−50.0
Federal	193,075	75,233	−51.0	1,994,969	897,144	−55.0
Total New Productive Capital	$110,481	$14,468	−84.0	$3,037,207	$1,612,620	−47.0
Private Investment	4,951	14,318	+262.0	117,706	207,880	+76.0
Federal (non-federal work)	5,530	150	−97.0	165,663	140,940	−15.0
Federal (federal work)	100,000	.....	.....	2,753,838	1,263,800	−54.0
ENR Construction Volume Index, 1913 = 100	155	85	−45.0	190*	102*	−36.0

† Adjusted for difference in number of weeks reported. * Nine-month average.

CONSTRUCTION COSTS . . . WAGE RATES . . . MATERIAL PRICES

	October 1943	October 1944	% Change	Changes September to October 1943 Sept.	1943 Oct.	%	1944 Sept.	1944 Oct.	%
ENR Construction Cost Index, 1913 = 100	294.31	301.06	+2.3	294.09	294.31	+0.1	300.46	301.06	+0.1
ENR Building Cost Index, 1913 = 100	231.29	236.00	+2.0	231.20	231.29	†	236.00	236.00	0

† Does not reflect increased costs due to overtime, lower labor efficiency, delivery delays, etc. †Less than .04 percent change.

ENR 20-CITIES' AVERAGE

Common Labor	$0.869	$0.886	+2.0	$0.869	$0.869	0	$0.883	$0.886	+0.3
Skilled Labor (Av. 3 trades)	1.620	1.640	+1.2	1.622	1.620	−0.1	1.640	1.640	0
Bricklayers	1.715	1.739	+1.4	1.715	1.715	0	1.739	1.739	0
Structural Ironworkers	1.673	1.694	+1.3	1.679	1.673	−0.4	1.694	1.694	0
Carpenters	1.472	1.487	+1.0	1.472	1.472	0	1.487	1.487	0
Cement, per barrel	$2.61	$2.68	+2.7	$2.61	$2.61	0	$2.67	$2.68	+0.4
Reinforcing steel, cwt.	2.79	2.79	0	2.75	2.79	+1.5	2.79	2.79	0
Structural steel, base	2.10	2.10	0	2.10	2.10	0	2.10	2.10	0
Sand, per ton	1.24	1.25	+0.8	1.24	1.24	0	1.23	1.25	+1.6
Lumber, 2x4 Fir, per M ft.	53.20	54.58	+2.6	53.20	53.20	0	54.58	54.58	0
Lumber, 2x4 Pine, per M ft.	48.60	53.38	+9.8	48.19	48.60	+0.9	53.38	53.38	0
Brick, common, per M	16.11	16.99	+5.5	15.93	16.11	+1.1	16.52	16.99	+2.8
Ready-mixed concrete, c. y.	7.37	7.45	+1.1	7.37	7.37	0	7.44	7.45	+0.1
Struct. clay tile, 3x12x12	79.34	81.00	+2.1	79.34	79.34	0	80.48	81.00	+0.6
Paving asphalt, cars, ton	15.34	15.40	+0.4	15.34	15.34	0	15.40	15.40	0

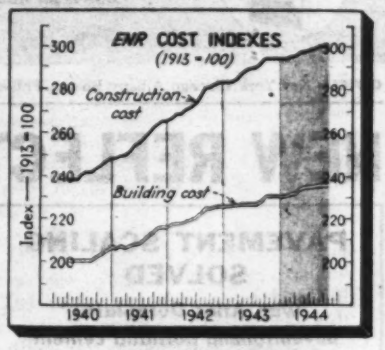
MATERIAL SHIPMENTS . . . . BUILDING PERMITS

	September 1943	September 1944	% Change	August 1944	% Change Aug.-Sept.
Steel (% operating capacity) A. I. S. I.	100.3	95.1	−5.2	96.1	−1.0

	August 1943	August 1944	% Change	Eight Months 1943	Eight Months 1944	% Change
Fabricated Structural Steel, tons, A. I. S. C.	50,229	44,118	−12.1	617,618	325,080	−47.4
Cement, thous. bbl., U. S. B. of M.	12,587	10,758	−14.6	80,936	61,875	−21.2
Building Permits, 215 cities, Dun & Bradstreet (,000 omitted)	$49,702	$123,320	+148.1	$326,811	$503,728	+54.1

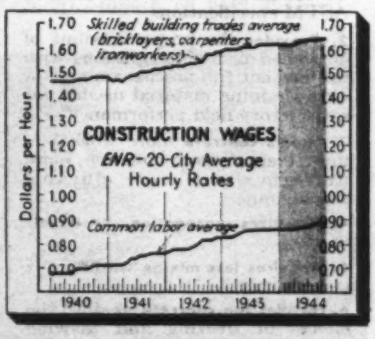
COST OF LIVING INDEXES . . . . EMPLOYMENT

	August 1943	August 1944	% Change	July 1944	% Change July-Aug.
Cost of Living Index, N. I. C. B.	103.8	105.1	+2.2	105.0	+0.1
Rent (Housing) Index, N. I. C. B.	90.8	90.9	+0.1	90.9	0
Total Employment (est.), thous., B. L. S.	39,860	38,771	−2.7	38,724	+0.1
Constr. Employment (est.), thous., B. L. S.	1,169	684	−41.5	685	−0.1



ENR INDEX NUMBERS

Base = 100	Construction Cost 1913	Construction Cost 1926	Building Cost 1913	Building Cost 1926	Volume '13	Volume '26
Oct., 1944	301.06	144.72	236.00	127.57	.....	.....
Sept., 1944	300.46	144.43	236.00	127.57	85	37
Aug., 1944	300.42	144.41	236.09	127.62	121	53
July, 1944	299.94	144.18	235.55	127.33	114	50
June, 1944	298.72	143.59	235.33	127.21	91	40
May, 1944	298.00	143.25	234.80	126.93	100	44
April, 1944	297.70	143.10	234.50	126.76	106	46
Mar., 1944	295.34	141.97	232.32	125.59	103	45
Feb., 1944	295.05	141.83	232.03	125.43	86	38
Jan., 1944	294.57	141.60	231.55	125.17	114	50
Dec., 1943	294.51	141.57	231.49	125.14	103	45
Nov., 1943	294.41	141.52	231.39	125.08	149	65
Oct., 1943	294.31	141.47	231.29	125.03	142	62
Sept., 1943	249.09	141.37	231.20	124.98	155	68
1943 (Av.)	289.96	139.38	228.75	123.66	176	77
1942 (Av.)	276.31	132.82	222.39	120.22	553	243
1941 (Av.)	257.84	123.95	211.46	114.32	375	164
1940 (Av.)	241.96	116.31	202.81	109.64	269	118



ENGINEERING CONSTRUCTION CONTRACTS — ENGINEERING NEWS-RECORD — SEPTEMBER, 1944

Engineering News-Record reports continental U. S. Construction projects of the following minimum costs—waterworks, excavation, drainage and irrigation, $15,000; other public works, $25,000; industrial buildings, $40,000; other buildings, $150,000

Four Weeks—Thousands of Dollars (000 Omitted)

	New England	Middle Atlantic	South	Mid West	West of Mississippi	Far West	United States September 1944	United States Nine Months 1944	United States Nine Months 1943	Canada
Public Works										
Waterworks	378	336	1,005	585	924	136	3,364	24,429	38,752	552
Sewerage	.....	438	263	659	817	712	2,889	23,852	31,114	119
Bridges, public	.....	158	535	310	367	107	1,477	9,888	14,566	25
Earthwork and waterways	87	.....	1,379	2,460	1,056	1,135	6,117	53,651	35,019	.....
Streets and roads	711	1,298	4,664	5,296	3,326	2,535	17,830	162,838	198,966	695
Buildings, public	1,545	7,942	8,167	5,152	9,310	14,634	46,750	510,925	1,164,292	4,793
Unclassified, public	589	1,534	6,626	225	1,200	9,757	19,931	302,711	676,074	363
Total public	3,310	11,706	22,639	14,687	17,000	29,016	98,358	1,088,294	2,158,783	6,547
Federal government (included in above classifications)	2,172	10,018	17,042	7,211	12,004	26,786	75,233	897,144	1,994,969	.....
Private										
Bridges, private	.....	.....	.....	.....	.....	.....	.....	1,357	3,876	.....
Industrial buildings	1,793	901	325	1,265	5,280	2,378	11,942	134,461	126,212	1,166
Commercial buildings	150	761	399	.....	2,680	1,560	5,550	114,369	169,612	.....
Unclassified, private	45	113	25	393	757	736	2,069	41,080	29,890	710
Total private	1,988	1,775	749	1,658	8,717	4,674	19,561	291,267	329,590	1,876
Total Engineering Construction:										
September, 1944 — 4 weeks	5,298	13,481	23,388	16,345	25,717	33,690	117,919	.....	.....	8,423
August, 1944 — 5 weeks	3,904	30,751	27,786	24,288	47,778	76,744	211,251	.....	.....	13,038
September, 1943 — 5 weeks	13,098	49,510	49,098	28,561	64,451	59,567	264,285	.....	.....	12,074
Nine Months — 1944	38,951	207,684	235,191	172,744	237,683	487,308	.....	1,379,561	.....	79,978
Nine Months — 1943	118,588	328,832	570,985	288,802	577,078	604,088	.....	.....	2,488,373	96,109

CONCRETE HIGHWAY NEWS

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Ordinary smooth curb reflects light away from the driver, and the curb is barely visible. But the saw-tooth faces of White Reflecting Curb made with Atlas *White* (not gray) cement catch headlight rays and reflect them back, right to the driver's eyes. This makes the curb stand out bright and clear. The diagrams be low show why.

When rain at night makes roa and curb a watery mirror, ordinar smooth curb is almost invisible. Bu White Concrete Reflecting Cur stands out more brightly than befor —at the time it is needed most. Da or night, it's a white guide to safet

For information on design and in stallation of White Concrete Re flecting Curb, write to our Atla White Bureau. Ask for your copy o the book, "A White Guide to Safety.

A smooth curb (left) wastes light . . . reflects it up and away from the driver. A White Concrete Reflecting Curb (right) conserves light . . . reflects it back to the driver. A smooth curb is barely visible at night; a White Concrete Reflecting Curb stands out—bright and clear.

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The Week In Engineering and Construction

ENGINEERING NEWS-RECORD • OCTOBER 5, 1944 • VOLUME 133 • NUMBER 14

Cities lag in planning for postwar public work

Col. Wm. N. Carey, chief engineer of the Federal Works Agency, tells American Public Works Association of conditions tending toward another WPA.

Plans for postwar public works in cities are not being converted from the idea stage to the blueprint stage at the rate that is necessary to avoid another WPA, according to Col. Wm. N. Carey, chief engineer of the Federal Works Agency, one of the principal speakers at the annual meeting of the American Public Works Association held in St. Paul, Sept. 24-27. Col. Carey based his conclusions on the findings of a recent survey of the postwar public works programs of state and local governments conducted by the FWA (*ENR* Sept. 21, vol. p. 331). Exclusive of federal-aid highway projects, said Col. Carey, city and state public works plans in the completed stage represent about $970,000,000, while the plans that have not progressed beyond the idea and preliminary stages total some 10 billions.

"We are far behind schedule in assembling the materials needed to bridge the gap between a war and peace economy," asserted Colonel Carey, and completed plans for needed public works are among the most important materials required. If these bridging materials are not ready when needed, said he, there would be no surprise if we suddenly had a big WPA crew doing its poor but expensive best to put us across the gap.

Flood control plans

A different condition respecting navigation and flood control project was reported to the conference by Maj. Gen. Eugene Reybold, Chief of Engineers, U. S. Army. Projects constituting a large program of navigation and flood control work, said General Reybold, are now on the shelf, and when conditions again permit the program can be initiated and prosecuted as rapidly as the people, through their representation in Congress, may direct." For the most part, however, these improvements will have to await the day of final victory over the Axis, according to General Reybold.

Much highway construction needed

A measure of the depletion and deterioration of highways may be obtained from an estimate of the work undone, which otherwise would have been undertaken during the past three years had it not been for wartime restrictions on construction and maintenance, according to H. S. Fairbank, deputy commissioner of the Public Roads Administration.

On all roads and streets the normal peacetime expenditure was roughly $2.04 billion per year—about $1.43 billion was spent for construction and $610 million for maintenance. During the three years of war, however, yearly expenditures have averaged only $780 million, with $360 million being spent for construction and $420 million for maintenance.

This indicated $1.07 billion annual reduction of construction expenditure. This amount represents, in its entirety, work not done that should be, and in many cases must be, done when the normal construction process is resumed, said Mr. Fairbank.

Furthermore, these figures indicate that we have accumulated an arrearage

(*Continued on page* 56).

Public Works Association gavel changes hands. Fredrick R. Storrer, retiring president of the American Public Works Association, turned over the symbol of office to Col. Stuart M. Weaver on Sept. 26 at St. Paul, Minn., where the association held its 50th annual meeting.

Colonel Weaver, who is chief of the Repairs and Utilities Branch, Military Construction Division, Corps of Engineers, is on military leave from his post as administrative head of the public works department in Montclair, N. J. Mr. Storrer is city engineer of Dearborn, Mich.

Little support found for MVA proposal

Both Harold L. Ickes, Secretary of the Interior, and Harry W. Bashore, Commissioner of the Bureau of Reclamation, have refrained from commenting on President Roosevelt's recommendation to Congress that a Missouri Valley Authority be set up and that like authorities be created for the Arkansas and Columbia River basins (*ENR* Sept. 28, vol. p. 379).

In transmitting his report to hearings that opened Sept. 26 before the Senate Committee on Irrigation and Reclamation on S. 1915, which authorizes the bureau to undertake the initial stage of its comprehensive plan for development of the Missouri basin, Secretary Ickes' only reference to the President's message was to say:

"The Director of the Bureau of the Budget has informed me that 'there would be no objection to the department submitting such report on the bills as it may deem appropriate in the light of the President's message of Sept. 21, 1944, ... with respect to the Missouri River Basin.' The President's message refers with approval to the principles announced in a resolution adopted recently by the governors of the Missouri River states and the members of the Missouri River States Committee. The resolution, you will recall, contains the following declaration: 'That authorization of the Bureau of Reclamation plan now before Congress and embodied in Senate Document 191 . . . is necessary to a comprehensive development of the Missouri River basin.' According, I deem it entirely appropriate to transmit this report to your committee and to recommend that it receive favorable consideration."

By thus ignoring the President's reference to a regional authority, and by emphasizing both Mr. Roosevelt's approval of the governors' resolution and the resolution's recommendation of the bureau's program, Secretary Ickes implied no enthusiasm for the MVA.

Commissioner Bashore's comment, in discussing the situation with a representative of *ENR* was: "The Bureau of Reclamation plan embodies the concept of basin-wide development." Concerning the President's recommendation of an authority for the Columbia Basin, he said merely that the bureau already has done much to develop the resources of that basin.

A number of the governors on whose resolution the President based his recommendation have been quick to assert that the President misinterpreted the resolution, and to put themselves on record as being opposed to an authority for the Missouri River.

Gen. D. I. Sultan promoted to lieutenant general

Maj. Gen. Daniel I. Sultan, of the U. S. Army, Deputy Commander-in-Chief, China, Burma, India Theater of Operations, on Sept. 12 was promoted to lieutenant general (temporary). As deputy to Gen. Joseph W. Stilwell, he is second in command of all operations in the China-Burma-India Theater.

General Sultan was born on Dec. 9, 1885, in Oxford, Miss. He was graduated from West Point in 1907, entering the Corps of Engineers. From 1912 to 1916 he was an instructor in engineering at West Point, and then served in the Philippines on construction of fortifications.

In 1918 and 1919, he served in Washington, D. C., on the War Department General Staff and was overseas with the AEF. Later he was in charge of the interoceanic canal survey and in command of the U. S. Army troops in Nicaragua. In 1932 he was district engineer at Chicago. In 1934 he was assigned as engineer commissioner for the District of Columbia for four years. In 1938 he was assigned to command the 22nd Infantry Brigade, Schofield Barracks, Hawaii, then becoming a brigadier general. Subsequently he became commanding general of the VIII Army Corps. and served in that capacity until 1943, when he took up his present work in the Far East.

General Sultan has been awarded the Distinguished Service Medal and the Oak Leaf Cluster, and he also received the Nicaraguan Presidential Medal of Merit.

Much building material which was ear-marked for Canadian homes and apartment buildings, will be sent to England instead to repair or rebuild homes damaged or demolished by robot bombs.

"Silver Star" is awarded to Maj. Gen. C. R. Moore

The Silver Star for gallantry in action has been awarded to Maj. Gen. C. R. Moore of Harrisonburg, Va., Chief Engineer of the European Theater of Operations.

The award was presented by Lieut. Gen. John C. H. Lee, Deputy Theater Commander, for General Moore's part in operations near Cherbourg on June 26.

General Moore participated in the capture of Cherbourg with assault troops of the Ninth Division, being present there for the surrender of the German port commander, Von Schlieben. A knowledge of German gained as a member of the Army of Occupation in World War I enabled General Moore to facilitate the Nazi general's surrender.

"By direction of the President," the citation read, "the Silver Star is awarded to Maj. Gen. Cecil R. Moore for gallantry in action while voluntarily accompanying front line companies on the Normandy front on or about 26 June, 1944.

"Maj. Gen. Moore, serving as Chief Engineer, European Theater of Operations, displayed great courage and gallantry while accompanying assault battalions. Maj. Gen. Moore, always with a view toward improving the activities of his service, was keenly observant, not only of engineer assault operations and procedures, but also of the manner in which infantry and engineerings work together in the use of assault equipment."

This is the second decoration for General Moore since D-Day. Shortly after the Allied landings in Normandy, he was awarded the Legion of Merit for his part in the invasion preparations.

Plan 5,000 Navy homes for Pacific coast

The National Housing Authority on Sept. 25 completed negotiations for the construction of 5,000 temporary family dwelling units on the Pacific coast, for occupancy by Navy officers and enlisted men who are being returned from overseas and assigned to permanent duty at shore stations. Selection of occupants will be made by Navy commandants.

Bids will be taken through the Federal Public Housing Agency—a unit of NHA—at the regional office in San Francisco, as soon as architects can be appointed and plans prepared for the work.

Engineering society heads oppose destruction of German industries

Presidents of five organizations issue a statement against reducing Germany to an agricultural state.

Presidents of five major engineering societies, in a statement made public at a press conference held in the Engineering Societies Building in New York on Sept. 29, came out against the "destruction or virtual dissolution" of Germany's industrial plant, proposed recently by Henry Morgenthau, Jr., Secretary of the Treasury, as being "economically unsound and containing the seeds of a new war". Signing the joint statement were the following: Malcolm Pirnie, president, American Society of Civil Engineers; Chester A. Fulton, president, American Institute of Mining and Metallurgical Engineers; Robert M. Gates, president, American Society of Mechanical Engineers; Charles F. Powel, president, American Institute of Electrical Engineers; and George G. Eve, president, American Institute of Chemical Engineers. At the press conference Mr. Pirnie pointed out that the views expressed were those of the five presidents, that there had not been time to take the subject up with their societies.

Engineers should be heard

"We believe that the part played by our 75,000 members of the above societies in the design, engineering and production of the implements for our armed forces in quantities adequate for victory, as well as our long experience as engineering industrialists in peacetime, entitle us to speak on this subject of paramount importance to the welfare of the world.

"Specifically, the fundamental fallacy in the proposal for the indiscriminate destruction of the German industrial system is that it fails to differentiate between the wartime and the peacetime economy of the Reich.

"We are for one simple, clear objective—an effective industrial means to stop Germany from starting another war. This objective should not be confused, especially before the war is even won, with the appropriate punishment of Germany or with the international arrangements for the long future to be made around the peace table by the representatives of the Allied Nations after victory is achieved.

"Germany must have its chance for recovery along peaceful lines after the war. Such recovery cannot come about through an economy wholly agricultural, even if that were practicable; or without industry to produce both for German needs and for the reconstruction of other nations of Europe; or without markets.

"This, we are confident, can be done without giving German industry the independence it would require to prepare for war again, either secretly or overtly. We recommend, therefore, not an indiscriminate destruction, but a selective restriction and control of German industry.

"Germany's capacity to make war would be eliminated by the following steps in regard to its industrial economy:

1. Eliminate all synthetic oil capacity and prohibit the reconstruction of plants and the importation of oil beyond normal peacetime inventories.

This would destroy the major part of Germany's internal oil resources. Coal is the raw material for synthetic oil. It is plentiful in Germany and only a small per cent is used in synthetic oil plants. It is not readily controllable in the Reich.

2. Eliminate 75 percent of Germany's synthetic nitrogen plant capacity and prohibit reconstruction of plants and all importation of nitrogen compounds. This will leave a capacity in Germany ample for peacetime nitrogen requirements. The principal ingredient of explosives is nitrogen. The relatively small amount of dynamite required for mining, quarrying, etc., should be under import control.

3. Eliminate 50 percent of Germany's steel-making capacity in those categories of plants which are most capable of producing essential war materials such as heavy forging, electrolytic and high alloy steels. Manganese, chromium, nickel and tungsten are practically non-existent in Germany. Also prohibit importation of iron ore, flux material, steel and steel products beyond normal peacetime inventories.

4. *Eliminate aircraft plants* and equipment. Aluminum and magnesium are the raw materials required for airplane manufacture. There are no important bauxite deposits in Germany. Importation should be prohibited. Aluminum and aluminum plants should be destroyed and importation of aluminum ingots beyond prewar peacetime needs be prohibited.

"Engineers play an essential part in providing employment in the economy of any nation. In this country especially they see their function not in narrow, professional terms, but in providing jobs and in promoting industrial production. They do not believe that crippling the normal peacetime industrial economy of any country, even an enemy nation, can promote world peace and reconstruction. We are opposed to any plan which would make postwar Germany a drag on the economy of all Europe, if not of the world, and a breeder of future wars."

Maiden voyage of a 34-ft. wide Navy lighter

Lighters for the Navy are being built in three sections at the Los Angeles plant of the American Pipe & Construction Co. The hulls are assembled at an inland yard on cars running on a wide-gage track under a traveling overhead crane. During assembly the sections are tack-welded together to assure correct alignment and fit. The "tacks" are then burned loose and the individual sections are loaded on a specially designed truck-trailer and transported 35 mi. to launching ways at Newport Beach, Calif.

The 33-ton rake section shown above will be handled by a 50-ton traveling gantry crane at the waterside yards, and joined with the two other sections to form a 110 x 34-ft. lighter. A corrugated, galvanized metal deckhouse will complete the assembly.

A state patrolman escorts the 34-ft. wide load while on the highway.

Lag in postwar plans for urban public works

(*Continued from page* 53)

of $3.21 billion worth of construction and $270 million of maintenance work, or a total of $3.48 billion of presently needed work.

If the war in Europe ends in 1945, said Mr. Fairbank, and if it is decided to catch up on this deferment in three years, the requisite annual expenditure will be about $2.5 billion for construction and $700 million for maintenance. Of this amount the annual required expenditure for rural road and highway work will be $2.31 billion—$1.79 billion for construction and $520 million for maintenance. There also should be a total of $890 million for city street work, $710 million being spent on construction and $180 million for maintenance.

In conclusion, Mr. Fairbank asserted that such a program of needed highway and street construction will employ during the first three postwar years 865,250 on-site and 1,263,850 off-site workers—a total of 2,129,100.

Blueprint now or WPA later

Symbolic of the general theme of the 4-day meeting was the program presented at luncheon of the second day, at which Edward J. Cleary, managing editor, *Engineering News-Record*, officiated as chairman. In presenting an interpretation of pending federal highway legislation, G. Donald Kennedy, vice president, Automotive Safety Foundation and chairman of the A.S.C.E. committee on postwar planning, pointed out that the recent Congressional approval of the reconversion bill recently passed by Congress (S. 2051), has a significant bearing on the preparation of postwar construction plans.

By virtue of this act, non-interest bearing federal funds will be advanced for postwar planning with the stipulation that it be repaid when and if construction funds are available. (*ENR* Sept. 28, vol. p. 380). He pointed out that for the first time an authorization has been made for the expenditure of federal funds within the corporate limits of cities. An initial $125,000,000 has been authorized for such work, with a total potential expenditure reaching $325,000,000.

There is one definite hurdle still facing cities and urban communities regarding postwar construction, cautioned Mr. Kennedy, and that is the lack of a definite policy towards the establishment of federal participation in local public works. Unless adequate plans now are made ready, Congress in the future will be unable to inaugurate a comprehensive public-works program.

"Blueprint now or WPA later," said Mr. Kennedy, might well be adopted as a slogan by city, county and highway officials. And he urged these agencies to exert every effort to induce their respective Congressmen to act favorably on the pending highway legislation at an early date.

Safe and efficient thoroughfares

Striking at the very heart of postwar planning, Burton W. Marsh, director of Traffic Engineering and Safety Department of the American Automobile Association, enumerated several singular concepts to be considered in establishing adequate thoroughfares. New ideas in city highway planning are sorely needed, taking into account the need for city-wide plans or, in some instances, metropolitan-area layouts. Streets and arterial highways do not require widening in all cases, despite the fact that a rapid growth is anticipated in postwar traffic, and better parking facilities must be provided as an aid in relieving congested urban traffic.

Certain areas must be reformed to provide larger residential areas, contended Mr. Marsh, and some large communities will require freeways or parkways designed to eliminate dangerous and often congested intersections.

That postwar planning officials must accept the responsibility of concentrating engineering skill and design on the safe and efficient operation of vehicles is obvious, asserted Mr. Marsh, and particular attention must be given to providing adequate high-speed thoroughfares into and through the heart of our larger metropolitan areas.

Another angle of postwar planning which confronts our cities lies in the economic development of communities, according to Herman E. Olson, city planning engineer, Minneapolis, Minn. Paralleling the proposal of the Committee for Economic Development, for increasing employment from 39,000,000 workers during 1940 to 55,000,000 after the war, there must be an increase in transportation and public facilities.

We cannot cope with this 41-percent increase in economic development without a commensurate development in city facilities such as streets, freeways, parkways, housing, recreation and service facilities, he added.

Brief reports on postwar planning by their respective cities were outlined by G. H. Herrold, planning engineer, St. Paul, Minn., and Geo. R. Thompson, city engineer of Detroit.

Injecting a new thought in the much-

From left to right, Col. William N. Carey, Chief Engineer, Federal Works Agency tells a "fish" story in connection with his analysis of postwar statistics to Frederic Bass, executive director of the American Public Works Association and Edward J. Cleary, managing editor of Engineering News-Record. Says Colonel Carey: "The $10 billions of public works in the idea stage suggests a similarity to statistics on the number of eggs spawned by the salmon. Of these terrific totals of fish eggs, only a few are fertilized and fewer still survive to become fish and food in the frying pan."

discussed subject of postwar planning, Carl H. Chatters, executive director, Municipal Finance Officers Association, Chicago, asserted that the proper timing of expenditures probably is more important than the amount of funds spent, if public works are to be made a worthwhile contribution to economic recovery during the transition from war to peace.

Such timing of expenditures can be proper only if plans are reduced to blueprints immediately for the most desirable work and if means of financing are certain and definitely known.

Moreover, commented Mr. Chatters, if federal or state grants are authorized to assist with public works, then it must be concluded, based on past experiences, that those cities with plans and money of their own will accomplish the most desirable improvements for their communities, while others will have to be content with "leaf raking" or with public works which do not contribute to the future growth of the community or its economic stability.

Advance engineering design

An insight into the status of certain advance engineering design was provided in a panel meeting on that subject, presided over by Capt. Samuel S. Baxter, Corps of Engineers, U. S. Army.

Many postwar public-works projects are contemplated by the city of St. Paul, according to Geo. M. Shepard, chief engineer, Department of Public Works, but sufficient advance design plans are not as yet underway. He called particular attention to the fact that new methods of financing city improvements must be found since the city's real estate tax has virtually reached its peak in ability to carry any further load.

In outlining postwar construction being planned by the state of Ohio in the Cleveland region, E. A. Fisher, city engineer of Lakewood, asserted that the lack of adequate state legislation to provide means and authority to the State Highway Department to engage consulting engineering service, as well as to engage in designing specific projects until enabling legislation is secured, was seriously delaying certain phases of Ohio's postwar construction program.

A comprehensive report on the advance planning now under way in western Pennsylvania was submitted by Michael Baker, Jr., consulting engineer, Rochester, Pa., and chairman of the panel on advance planning. He described in detail the advance engineering design as applied to the 9.3-mi., $25,000,000 Penn-Lincoln Parkway under design by the Pennsylvania Department of Highways for Pittsburgh.

Other advance planning in Pennsylvania covered by Mr. Baker included Beaver County's $52,000,000 five-year postwar plan of public and private construction as well as its $110,000,000 long-range program.

Veteran's awards

The Veteran's Award of the American Public Works Association, commemorating 30 years' continuous employment by any one city was awarded posthumously to the late Henry L. Howe, city engineer of Rochester, who died May 31, 1944.

Active members receiving the award at this conference include: Lyons Mussina, city engineer, Williamsport, Pa.; Lawrence C. Whitsit, city engineer of Highland Park, Mich.; Guy B. Walker, city engineer of Wilkes-Barre, Pa.; Wm. G. Helber, superintendent of refuse disposal, Portland, Ore., and Herbert W. Kueffner, director of public works and city engineer, Durham, N. C.

Indicative of the growing interest in public works among state, city and county officials is the increase in membership of the American Public Works Association during the past year, according to the annual report of Frederick Bass, executive director. Active membership to date totals 1,037 as compared with 883 one year ago. Attendance at this year's meeting totaled 396 men and 97 ladies. Milton Rosen, commissioner of public works, St. Paul, was general chairman of local arrangements.

New officers

In line with the association's new policy of country-wide expansion, two new vice presidencies have been added to the governing board. Col. Stuart M. Weaver, chief, repairs and utilities branch, Office of Chief of Engineers, Washington, D. C., is the newly elected president, succeeding Frederick R. Storrer, city engineer of Dearborn, Mich.

Newly elected vice presidents, including their respective districts are: Capt. Samuel S. Baxter, Corps of Engineers, U. S. Army (Eastern); Lloyd Johnson, commissioner of streets and electricity, Chicago (Central); J. W. Morgan, director of public works, Birmingham, Ala. (Southern); and Walter N. Frickstad, city engineer, Oakland, Calif. (Western). Albert P. Learned, consulting engineer, Kansas City, Mo., was re-elected treasurer of the association.

Abstracts from the papers on refuse collection and disposal; problems of airway, railway and highway transportation; street cleaning and snow removal on city streets; and the organization of public works engineering personnel presented at the technical sessions will be published in a forth-coming issue.

Long Japanese tunnel doubted by engineers

Newspapers recently have reported that the Japanese have constructed a tunnel under the Strait of Fushima between the Japanese home island of Honshu and the mainland peninsula of Chosen. The tunnel is said to be about 100 miles long between the ports of Shimonoseki and Fusan, coming up on some islands enroute. The reason given for the tunnel construction is fear that American submarine action in the strait may stop shipping to the Asiatic mainland, thus cutting off essential food and supplies.

If completed, the tunnel is the longest in the world and probably was built

on the shortest construction schedule ever undertaken. *Engineering News-Record* has been unable to verify the story. In fact, engineers who were in that area of Japan as recently as 1941 do not believe that the tunnel had even been considered as a possibility at that time and are of the opinion that it would take many years to build such a passage. Volcanic and earthquake conditions are especially bad in the area through which the tunnel would pass.

There is a recently completed tunnel from Shimonoseki to Moji on the adjacent island of Kyushu (*ENR*, Nov. 26, 1942, p. 752). This two-mile long, single-track railway structure was started in 1936 and completed in 1942 at a cost of $24,000,000. About 3,000,000 workers were used on the project. It is probable that the large figure included off-the-site workers as well as those on the actual construction. However, on the ratio of 3,000,000 workers for even part of six years to build a two-mile tunnel, a 100-mile tunnel in three years does not appear feasible, especially when many sources of material and equipment have been cut off.

Powered concrete ships have all been launched

McCloskey & Co. recently launched the last three concrete cargo ships of its contract for 24 vessels, each 366 ft. long, built at Tampa, Fla., for the U. S. Maritime Commission. Most of the McCloskey ships, the only powered concrete vessels of commercial size built in this country since 1918-21, are now in service. An article describing the design and construction of the vessels, which have a carrying capacity of 4,400 long tons, will appear in an early issue of *ENR*.

Steel coastal cargo vessels, also for the Maritime Commission, are now being built in the yard. Three vessels will be built at a time in each of the three 1,200 ft. long basins (*ENR*, July 15, 1943, vol. p. 152). An additional 529 ft. long basin is available for dry-docking ships. It is expected that most of the workers on the concrete ships can be employed on the steel construction, but carpenters will suffer some from the change.

Mexican "commission" is only a private firm

In our issue of Aug. 3, vol. p. 132, we published a report from our correspondent in Mexico that "The Mexican government has established a commission in Washington, D. C., under the direction of Felix Villasenor, for the purpose of purchasing all kinds of machinery made in the United States for resale in Mexico."

We now learn through the Asociacion Mexicanna de Importadores de Maquinaria, a legally constituted trade association composed of importers, representatives and distributors of U. S. machinery in Mexico, that no such commission has been established by the Mexican government. Furthermore, Alonso Rivas, manager of the Compania de Desarrollo Industrial y Agricula de Mexico, S. A., states that his firm has established a commission in Washington for the purpose reported, but that it exists as a private business enterprise and in no way is officially connected with the Mexican government.

JOBS OF THE WEEK

WASTE ALCOHOL PLANT, Springfield, Ore.

Defense Plant Corp., Washington, D. C., awarded a contract for wood waste alcohol plant to Ford J. Twaits Co. and Industrial Engineers & Contractors, Tacoma, Wash., at $1,185,000.

HYDRAULIC FILL, Boston, Mass.

Gahagan Constr. Corp., New York, N. Y., was the lowest bidder for placing hydraulic fill in embankments A and B, at General Edward Lawrence Logan Airport, East Boston, at $2,170,000. Commonwealth of Massachusetts, Boston, Mass., opened bids. The Department of Public Works, Waterways Div., Boston, is the engineer.

BRIDGE CRANE, Hunters Point, Calif.

Bureau of Yards & Docks, Navy Dept., Washington, D. C., awarded a contract for bridge runway at Navy Dry Docks, to American Bridge Co., Washington, D. C., at $1,392,535.

COMPLETING RIP-RAP AT Kingsley Dam, Nebraska

Central Nebraska Public Power & Irrigation District, Hastings, awarded a contract for completing rip-rap on upstream slope of Kingsley Dam and abutments on north bank of stilling basin and on road dikes approaching south abutment, to Tobin Quarries Inc., Kansas City at $2,839,940.

NAVAL DEPOT, Vancouver, B. C.

Columbia Bridge & Dredging Co., Ltd., Vancouver, B. C., has been awarded a contract for the construction of a naval depot by the Department of National Defense (Sea) Ottawa, Ont. The estimated cost is $1,400,000.

PLANT, Hamilton, Ont.

Frid Construction Co., Hamilton, has been awarded a contract by the Steel Company of Canada, Ltd., Hamilton, for a plant to cost $8,000,000 with equipment.

CHEMICAL PLANT, Potter Township, Pa.

Koppers Co., Tar and Chemical Division, Pittsburgh, Pa., will construct by day labor a chemical plant, including synthetic rubber special chemical processing plant, storage, tank, pump house, office. The estimated cost is $1,000,000.

Note—Additional bidding and contract news on many projects large and small appear in the Construction News section beginning on page 165.

MEETINGS

National

AMERICAN ASSOCIATION OF PORT AUTHORITIES, annual meeting, Hotel New Yorker, New York, N. Y., Oct. 10-13.

FEDERATION OF SEWAGE WORKS ASSOCIATIONS, annual meeting, William Penn Hotel, Pittsburgh, Pa., in conjunction with 17th annual conference of the PENNSYLVANIA SEWAGE WORKS ASSOCIATION, Oct. 12-14.

INTERNATIONAL CITY MANAGERS' ASSOCIATION, annual conference, Medinah Club, Chicago, Ill., Oct. 12-17.

AMERICAN WELDING SOCIETY, 25th annual meeting, Hotel Cleveland, Cleveland, Ohio, Oct. 16-19.

SOCIETY FOR EXPERIMENTAL STRESS ANALYSIS, fall meeting, Carter Hotel, Cleveland, Ohio, Oct. 17-20.

ENGINEER' COUNCIL FOR PROFESSIONAL DEVELOPMENT, 12th annual meeting, 29 West 39th St., New York, N. Y., Oct. 20-21.

AMERICAN MUNICIPAL ASSOCIATION, annual conference, Hotel Blackstone, Chicago, Ill., Oct. 25-27.

NATIONAL COUNCIL OF STATE BOARDS OF ENGINEERING EXAMINERS, annual meeting, Hotel Lafayette, Lexington, Ky., Oct. 30-31.

AMERICAN INSTITUTE OF STEEL CONSTRUCTION, annual meeting, Atlantic City, N. J. Oct. 31-Nov. 2.

HIGHWAY RESEARCH BOARD, annual meeting, Netherland Plaza Hotel, Cincinnati, Ohio, Nov. 22-25.

Regional and Local

SOUTHWEST SECTION, AMERICAN WATER WORKS ASSOCIATION, Stephen F. Austin and Driskill Hotels, Austin, Texas, Oct. 17-19.

MISSOURI VALLEY SECTION, AMERICAN WATER WORKS ASSOCIATION, Hotel President, Kansas City, Mo., Oct. 23-24.

CALIFORNIA SECTION, AMERICAN WATER WORKS ASSOCIATION, annual meeting, Hotel Biltmore, Los Angeles, Calif., Oct. 24-26.

WEST VIRGINIA SECTION, AMERICAN WATER WORKS ASSOCIATION, annual meeting, Hotel Chancellor, Parkersburg, W. Va., Oct. 26-27.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA, 5th annual water conference, William Penn Hotel, Pittsburgh, Pa., Oct. 30-31.

CAROLINA BRANCH, ASSOCIATED GENERAL CONTRACTORS OF AMERICA, 24th annual meeting, Carolina Hotel, Southern Pines, N. C., Oct. 30-31.

OBITUARY

George A. Winsor, 71, a hydraulic ineer died at Pleasantville, N. Y., Sept. 26. Until his retirement in 33 he had been engaged, for some rs in engineering work on the south- section of the New York City water- d. Born in Johnston, R. I., he was ated at Brown University, and dur- the earlier portion of his career ilt sewers and water works for the y of Boston.

Harry H. Gowins, 78, contractor and mer water commissioner of Dallas, s., died there Sept. 17. Mr. Gowins ilt many Dallas public schools and ic buildings.

Frank H. Waddill, 76, for many rs prominent in civil engineering in w Orleans, La., died Sept. 19. A duate of Louisiana State University 1885, Mr. Waddill went to New Or- s in 1890. He was a pioneer in eying of large tracts of land devel- d as city additions. He was also in- ested in a ship canal into New Or- s, and recently suggested two routes such a waterway.

P. C. Pettit, 60, Arlington, Va., died t. 22. He was an engineer at the t Washington Quartermaster Depot, meron Run, Va. He went to work the War Department in 1909, sub- quently being stationed at posts in country and in Hawaii. He worked Fort Meyer, Va., under Gen. George Patton. He was one of the inspecting ineers at the Pentagon Building dur- its construction. He received a dal "for outstanding services" during first World War while working at lter Reed Hospital as superintendent construction.

Robert Lee Herrin, 67, pioneer con- ctor of Dallas, Texas., died Sept 6.

Louis Sylvester Johnson, contractor, o had built many buildings in Flor- , died Sept. 18 in Palatka, Fla.

L. S. Houston, 50, city manager of nroe, N. C., for the past four years, d Sept. 24.

ydney W. Taylor, Jr., 69, for more n 20 years a consulting traffic engi- r for major bridge constructions, in- ding San Francisco's Golden Gate dge, died Sept. 26 in Berkeley, Calif. fter being graduated from Princeton versity, Mr. Taylor was consulting traffic engineer on bridges in the United States, Russia and Canada. In 1929 he became traffic engineer for the Golden Gate district in his native San Francisco county, the position he held until his death.

News of the Week
Continued on p. 108

Used equipment freed

The War Production Board has revoked, order L-196 that required distributors and contractors owning shovels, cranes, draglines, motor graders and track-laying tractors to register their equipment in WPB regional offices, and to obtain approval for sales.

CONTRACTS AND CAPITAL

CIVIL ENGINEERING construction volume in continental United States totals $17,919,000 for the four weeks of September, an average of $29,480,000 for each of the four weeks of the month, the second lowest reported in 1944. This weekly average volume, not including the construction by military engineers abroad, American contracts outside the country, and shipbuilding, is 30 percent below the average for the five weeks of August, 1944, and 44 percent below the average for the five-week September, 1943 average.

Private construction, on the weekly average basis, is 23 percent lower than a month ago, and 47 percent below the corresponding 1943 month. Public work is 31 and 44 percent lower, respectively, than a month ago and a year ago. State and municipal construction is 13 percent under the preceding month, but tops the 1943 month by 16 percent. Federal volume declines 36 percent from last month, and 51 percent from last year.

The current month's construction brings 1944 volume to $1,379,561,000 for the first three-quarters of the year, a total 45 percent below the $2,488,373,000 reported for the period in 1943. Private work, $291,267,000, is 12 percent lower than in the nine-month 1943 period, and public work, $1,088,294,000, is down 50 percent.

CONTRACTS

Continental U. S. Only
(Thousands of Dollars)

	Week Ending Oct. 7 1943	Sept. 28 1944	Oct. 5 1944
Federal	$29,141	$19,201	$16,380
State & Municipal	8,203	6,306	6,824
Total public	$32,344	$25,507	$23,204
Total private	5,440	5,338	3,326
TOTAL	$37,784	$30,845	$26,530
Cumulative 1944	(40 weeks)		$1,406,091
1943	(40 weeks)		$2,526,157

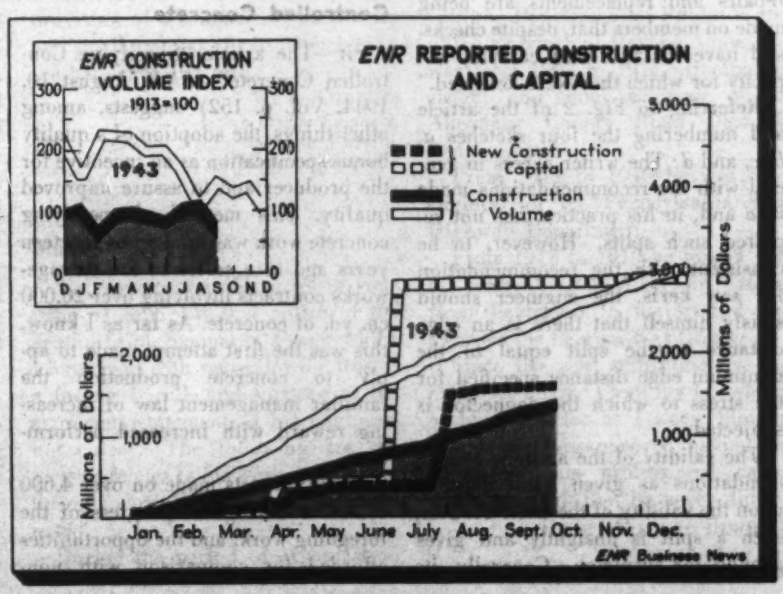
Note: Minimum size projects included are: Waterworks and waterways projects, $15,000; other public works, $25,000; industrial buildings, $40,000; other buildings, $150,000.

NEW PRODUCTIVE CAPITAL

	1943 Cumulative 40 Weeks	1944 Cumulative 40 Weeks
NON-FEDERAL	$284,139	$351,670
Corp. Securities	17,408	96,795
State & Mun.	101,053	113,935
RFC Loans	14,545	57,940
FPHA Loans	3,133	.....
REA Loans	20,000	20,000
Fed.-Aid Hwy.	128,000	63,000
FEDERAL	$2,753,838	$1,263,800
TOTAL CAPITAL	$3,037,977	$1,615,470

ENR INDEX NUMBERS

		1913	1926
Index base=100			
Construction Cost.	Sept. '44	300.46	144.43
Building Cost	Sept. '44	236.00	127.57
Volume	Aug. '44	124	53.


ENR CONSTRUCTION VOLUME INDEX
1913=100
1943
D J F M A M J J A S O N D
ENR REPORTED CONSTRUCTION AND CAPITAL
New Construction Capital
Construction Volume
1943
Millions of Dollars
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ENR Business News

Comment and Discussion

Readers' opinions on matters that concern engineers and contractors

Timber Checks and Splits

Sir: The article "Are Timber Checks and Splits Serious" in *ENR*, July 27, 1944, vol. p. 110, appears to be based on the concept that green material is the sole cause of trouble now occurring in many timber structures. The writer's experience in the inspection of some 500 buildings on the West Coast is to the contrary in that he finds practically all of the troubles result from faulty design and that the checks and splits discussed in the July 27 article result mainly from excessive stresses rather than from the seasoning of the timber. When a split "open," its width generally increases with time.

To a very large extent the validity of the authors' conclusions depends upon the tests with "deliberate saw kerfs." Because of their bearing upon the argument, it is regrettable that the results were not given in considerable detail. Insofar as the writer has information, the tests on timber connectors have not included directly, long-time loading.

Upon the basis of his present information and limited to the structures which have been under his observation, the writer challenges the statement "expensive and unnecessary repairs and replacements are being made on members that, despite checks, still have the full load carrying capacity for which they were designed."

Referring to Fig. 2 of the article and numbering the four sketches *a*, *b*, *c*, and *d*: The writer agrees in general with the recommendations made in *a* and, in his practice, has not repaired such splits. However, to be consistent with the recommendation for saw kerfs, the engineer should satisfy himself that there is an edge distance to the split equal to the minimum edge distance specified for the stress to which the connector is subjected.

The validity of the authors' recommendations as given in *b* depends upon the validity of the tests. At best, such a split is unsightly and gives ground for suspicion. Generally, its width increases with time. A stitch bolt or clamp is comparatively inexpensive insurance against the cost of replacing the member. As a rule, it is more economical to make the repair in connection with other servicing than to keep a constant watch for further opening of the split. Moreover, a stitch bolt or clamp is more effective if applied at an early stage in the development of the split. Stitch bolts are not a "cure-all." With substandard end distances and thin, wide material, the drilling of a hole for the stitch bolt may do more harm than the stitch bolt will correct.

Referring to *c* and *d*, the writer would in turn refer to the photographs on page 575 of "Civil Engineering" for December 1943. He also knows of cases (with tight bolts) where only hair cracks were apparent at the time of inspection but in which, 60 days later, the splits had opened to such an extent that the wood had fallen away so completely as to expose the ring. In such cases, the timber presumably had reached the point of equilibrium moisture content.

G. B. WOODRUFF,
Consulting Engineer,
San Francisco, Calif.

Controlled Concrete

Sir—The article "Specifying Controlled Concrete" (*ENR*, August 10, 1944, Vol. p. 152) suggests, among other things, the adoption of a quality bonus specification as an incentive for the producer and to assure improved quality. This method of specifying concrete work was used by us fourteen years ago in a series of five sewage-works contracts involving over 20,000 cu. yd. of concrete. As far as I know, this was the first attempt made to apply to concrete production the familiar management law of increasing reward with increased performance.

Based on tests made on over 4,600 cylinders during the progress of the foregoing work, and the opportunities afforded for comparison with non-bonus concrete production on the same contracts, the outcome of this procedure was eminently successful in getting better concrete at a very moderate cost for extra quality.

For those interested in the details pertaining to this procedure, I refer them to an article by the writer in *ENR*, Oct. 12, 1933, p. 434, entitled "Improving Concrete Quality by Paying Bonuses."

M. H. KLEGERMAN,
Alexander Potter Associates,
Consulting Engineers,
New York, N. Y.

Composite Action

Sir: The letter from C. P. Siess relating to composite action between steel beams and concrete decks (*ENR*, Jan. 13, 1944, vol. p. 23) was of great interest to me as such composite structures have been constructed in Australia for some years.

Construction in Victoria has been carried out by the County Roads Board, under the direction of the engineer for bridges, M. G. Dempster, using methods of design evolved by A. W. Knight, chief engineer, Department of Public Works, Tasmania. Details of these methods have been published in the *Journal* of the Institution of Engineers, Australia, as follows: "The Design and Construction of Composite Slab and Girder Bridges," A. W. Knight, Jan. 1934; "Simplified Calculations for Composite Beam Bridges," A Burn, Mar. 1935.

The structures, in general, consist of lines of rolled steel joists or plate girders on which is cast a concrete deck, the steel girders and the concrete deck being positively fastened together by steel bars welded to the top flange of the girder and embedded in the concrete. The accompanying photograph shows a typical arrangement of bars. These bars are designed to transfer the horizontal shear developed between the girder and concrete under beam action of the composite section. To obtain a more economical section it is usual to haunch the deck over the beams.

The basis of design is that, once the concrete has hardened, the steel girders and concrete deck act together as a unit. To obtain the benefits of composite action for dead loads as well as live loads it is usual to support the steel girders at a predetermined level at two or more points in

he span during casting of the concrete deck, these supports not being emoved until the concrete has adequately hardened. Further economies an be effected through pre-stressing he steel girders by holding them own at the ends and wedging upards at the internal points of upport. By proper choice of the mount of pre-stressing it is possible to obtain a uniform tension cross the whole of the steel portion f the composite section under maximum loading conditions.

Some allowance should be made in his type of structure for the effects of lastic flow and shrinkage of the concrete. The stresses due to the latter ffect can be calculated, but those due o the former are uncertain. Observaions on completed structures indicate, however, that the increase in teel stress due to plastic flow is not erious and that in general the combined effect of plastic flow and shrinkge of the concrete would increase the tress in the lower flange of the steel irder by not more than 2,000 lb. per q. in.

That the assumptions made in deign are correct has been verified by est on a bridge over the Maribyrnong River at Melbourne, Victoria, Australia. This bridge of composite type (steel girder and concrete deck) is 52 t. wide, the spans being 70 ft. long nd freely supported. There are 6 ines of welded steel girders on 8-ft. enters, each girder consisting of a eb plate ⅜x54 in., a top flange ½x12 n. and a bottom flange 1¼x14 in. The oncrete deck is 8½ in. thick, aunched 6 in. at the girders.

The test load was 180,000 lb. or 8 xles, of which 108,000 lb. was on 3 ear axles and concentrated in an area ft. 6 in. by 9 ft. 9 in. Measured aximum live load deflection was .180 in., as compared with a calulated maximum live load deflection f 0.190 in. Measured and calculated teel stresses were 4,000 lb. per sq. in. nd 4,100 lb. per sq. in., respectively.

That the measured and calculated eflection and stress are in such close greement is to a certain extent ortuitous, since the values of the calulated moment of inertia and, conequently, the stresses in the comosite section, are dependent on the ssumed value of the ratio between e elastic moduli of the steel and conrete. In this case the concrete conained seven bags of cement per cu. yd. and was six years old, so that the assumed value of "n"=10 is considered reasonable.

In this test, the test load passed down the bridge immediately over the two central girders. It is interesting to note that deflection measurements indicated that only 60 percent of the load was carried by these girders, 30 percent being transferred to the adjacent girders and 10 percent

On the Maribyrnong River Bridge at Melbourne, Australia, hooked steel bars were welded to the top flange of the girder and embedded in the concrete deck to transfer horizontal shear developed by beam action of the composite section.

to the two outer lines. It would appear that approximately 50 percent of this transfer was effected through cross-frames provided at the center of each span, the remainder being transferred by the very stiff concrete deck.

In conclusion, as an indication of the economy of this type of structure, it is pointed out that the moment of inertia of the composite section is nearly four times that of the steel section alone; and that this desirable result is obtained very cheaply by provision of a few welded shear bars and small amount of extra concrete in the haunches and slab.

W. A. OZANNE,
Acting Bridge Engineer, County Roads Board of Victoria, Melbourne, Australia

Samuel D. Foster

Sir: Among the obituaries in your issue of Sept. 14, is a notice of the death of Col. Samuel D. Foster which I have read with regret for the loss of a former friend, and surprise at the erroneous statement of his engineering career. The following are the facts as relates to his work at Panama, the only part of his engineering career noted.

During the period of organization and initiation of construction of the Panama Canal, I served as resident engineer successively under the three chief engineers, Mr. Wallace, Mr. Stevens and Col. Goethals, in charge of design and construction of water works, sewers, paving, and road building in the City of Panama and the vicinity. This work was begun in 1904 and completed in 1907.

Mr. Foster came on my staff as a transitman in June 1907, after working as a member of survey parties on river and harbor work with the Corps of Engineers at Pittsburgh. He had no responsibility for paving the City of Panama which was about finished when he arrived.

The City of Panama had no mud roads to be transformed into paved streets. The streets were originally paved with cobble stones which were torn out for the necessary ditching in the installation of water mains and sewers during 1905-1906. During this time in periods of rain the uncompleted street surfaces were in a very muddy condition but as rapidly as possible they were given permanent pavements of vitrified brick on a concrete foundation, which pavements in the main are still giving satisfactory service 38 years later.

Foster was an excellent engineer and did good work as a junior member of my staff and had some responsible charge of work after 1907 when all municipal engineering in Panama came under the jurisdiction of Rear Admiral H. H. Rousseau, Civil Engineer Corps U.S.N., and member of the canal commission. He left Panama in March 1908 and spent some months with the Department of Public Works of the Province of Havana, Cuba, and was from 1908 to 1911 principal assistant and chief engineer of the Alleghany County Road Dept. in Pennsylvania.

From 1911 to 1915 he was chief engineer of the Pennsylvania State Highway Department.

From 1918 to 1919 he served with the 28th Division A.E.F. in France, from lieutenant to major and was awarded the Belgian War Cross.

Since the war, unfortunately, our paths lay apart. From my knowledge of his character as I knew him, he would have disapproved having the history of his professional career based on work that he never did.

HENRY WELLES DURHAM,
New York

EDITORIALS

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A Seat at the Peace Table

A DEMONSTRATION of the advantage that would come from having some engineers at the peace table was given last week when the presidents of five major engineering societies issued a statement exposing the fallacies in the plan for de-industrializing Germany, as had been proposed by Secretary Morganthau, Reduction of Germany from an industrial to an agricultural economy, they demonstrated, was not only unsound economically, but would plant the seeds of another war. Instead of destruction of Germany's industry, the five presidents outlined a way in which her peacetime industrial position in the world's economy could be restored and maintained to the advantage of the world at large while depriving the country of products necessary to the making of war in the future. There is sound logic in what the heads of the great engineering societies have said. Their plan shows clearly that something more than a knowledge of world politics is needed to create a lasting peace. Knowledge of the economics and engineering that keep a world economy in balance also is required.

Bridge Girders on Pontoons

So VERSATILE have the Seabees become in devising new uses for their pontoon cell units—the 5x5x7-ft. welded steel boxes that are assembled into piers, barges, drydocks, oil storage tanks, seaplane ramps and the like—that many of their ingenious developments are beginning to be accepted as a matter of course. In this issue, however, is published an account of one that is spectacular enough to deserve wide acclaim—the use of articulated strings of cells as an 83-ft. span girder bridge. Whereas, in most prior uses, the pontoon cells have taken advantage of their buoyancy or of their ability to hold liquids, in the case of the girder bridge they became simply structural members, and with a hollow section that is unusually efficient from a load-carrying standpoint. But while the use of a pontoon bridge "in the air" is unusual enough of itself, the spectacular quality of the development is enhanced by the erection of the girders as "cantilevers," eliminating the need for falsework. Indeed, this may merely be the jumping off place for Seabee ingenuity and imagination to make possible very much longer spans. This is suggested by the fact that there was a surprisingly small deflection in the assemblies when they were cantilevered, and also by the speed shown by the 27th Construction Battalion in launching one of the 83-ft. strings into position in only 11 minutes. All this would seem also to indicate that under some conditions, at least, the Seabee pontoon cell may have advantages over the British Bailey truss as a military bridge.

Postwar Public Service

WHEN the American Public Works Association held its 50th annual meeting in St. Paul last week there was none of the fanfare usually attendant upon such an important anniversary. In deference to the sobering realities of war and postwar responsibilities, the delegates devoted complete attention to discussion of current and anticipated problems relating to public-works administration and engineering. Had time and circumstances permitted, however, proper satisfaction could have been expressed over the growth of the association and the unique service it renders. From its beginnings in 1894 as the American Society for Municipal Improvements, up to a decade ago when, as the American Society of Municipal Engineers, it merged with the International Association of Public Works Officials to form the American Public Works Association, and on to the present time, the organization has always worked for higher standards of city engineering and municipal administration. This legacy from the past plus the financial aid received from the Spelman Fund gives the APWA both the incentive and the means to be of even greater service to municipalities in the future. On the occasion of the fiftieth anniversary meeting there was evident a determination to meet such a challenge and to make the second half-century even more useful than the first.

Better Timber Structures?

DEFECTS IN DESIGN and omissions in construction have been more responsible for difficulties with timber structures than has the use of faulty or green timber, according to Glenn B. Woodruff in an article in this issue. In directing the repair of some 500 timber buildings on the West Coast, Mr. Woodruff found that 95 percent of them required little more than bolt tightening, and that in the remaining 5 percent only a very small amount of the difficulty could be attributed to defective lumber. The major

troubles could be charged to lack of knowledge of how green timber behaves, to unexpectedly high secondary stresses and to unplanned-for eccentric loadings. Investigation of structures in other parts of the country indicates somewhat the same conditions, but points more specifically to undue liberties with design taken by "field" men. More knowledge of the drying action of timber and its use in design is recommended by Mr. Woodruff rather than drastically limiting the field of green timber as a structural material. To Mr. Woodruff's suggestions, better knowledge of fundamental design principles and closer inspection in the field may also be added. Timber, even green timber, is a structural material of importance. It deserves as scientific treatment as any other.

The Proposal for an MVA

THE PRESIDENT HAS RECOMMENDED to Congress that a Missouri Valley Authority be set up to take over coordinated development of the natural resources of the Missouri River basin. He would pattern the MVA after the TVA, and he would have Congress set up authorities for like purposes in the Arkansas and Columbia River basins. It would be well to take a careful look at the logic of such a proposal before jumping to the conclusion that it is a simple solution to a complicated problem.

The President based his proposal on a resolution adopted by the governors of six Missouri Valley states asking that Congress direct the U. S. Engineers and the Bureau of Reclamation to bring in a coordinated plan for the development of the water resources of the Missouri based on somewhat conflicting plans laid before Congress by those two agencies in recent months. The governors did not ask for a Missouri Valley Authority, and there is good reason to doubt that such an authority should be created or that a number of them, if established in the Columbia, Arkansas and other river basins, could carry on the development of those rivers as efficiently as the existing federal agencies can.

The President cited the Tennessee Valley Authority in support of his proposal. Few will question the efficiency of the TVA, but logic appears to indicate that it should be looked upon as the exception rather than the rule. If the development of each major river basin is to be done by a separate agency with an independent staff, then we will have a multiplicity of new federal agencies doing similar work. What is more, to supply these staffs we will have to disband and chop up into little pieces the two federal agencies that have done this work so efficiently for many decades—the Corps of Engineers and the Bureau of Reclamation. In this connection it is to be remembered that the TVA was set up during a business depression, which made it possible for Arthur Morgan to hand pick his lieutenants from a large reservoir of talent that is not usually available.

Other reasons for the success of the TVA undertakings are found in the fact that the valley is homogeneous, its agricultural and industrial development were behind that of other parts of the country and so provided a power market capable of large expansion, and large quantities of power could be developed easily on the river and its tributaries. Further, the war, with its practically unlimited demand for power, gave the TVA an unprecedented opportunity to make a spectacular record in developing its power resources.

Most of these factors are not to be found in the Missouri valley. There is no cheap and easily developed power. Moreover, the river valley is so large and so varied in climate that the interests of its people are exceedingly diverse; the people of the lower valley want the river's water for navigation, while those in the arid upper reaches want it for irrigation.

The six governors have shown the way in which development of the Missouri River's resources can be put under way quickly in the postwar era. Congress can instruct the engineers of the corps to sit down with those of the bureau to reconcile their plans. At the same time, decision can be reached as to which agency will construct the principal structures. Actual authorization can be carried in the pending omnibus rivers and harbors bill and in a bill now in Congress authorizing the bureau to undertake the initial stages of its plan.

Conflicts, of course, will arise when Congress comes to approve any plan because there are now more irrigation schemes proposed for the upper basin than there is available water in the river. These, however, are questions that Congress, not the corps nor the bureau nor a river authority should decide. Establishment of a Missouri Valley Authority would retard rather than speed development of the Missouri River basin.

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EDWARD J. CLEARY, *Managing Editor*. *New York:* V. T. BOUGHTON, A. N. CARTER, H. W. HUNT, E. R. DENMARK. *Chicago:* H. W. RICHARDSON, J. R. CARR. *Washington:* PAUL WOOTON, CHARLOTTE DuBOIS. *San Francisco:* N. A. BOWERS. *Consulting Editors:* F. E. SCHMITT, W. W. DeBERARD
EDITORIAL OFFICES: 330 WEST FORTY-SECOND STREET, NEW YORK, N. Y.

Pontoon Cells Used for Girder Bridges

N. A. Bowers
Pacific Coast Editor, Engineering News-Record

Contents in Brief—Bridges have been built with the Navy's 5x5x7-ft. steel pontoon cells by two methods; (1) by floating strings of the cells to the site where they are hoisted to place to form a 75-ft. span and (2) by delivering the strings of cells for an 81-ft. span on trailers to the approach trestle, and then thrusting them out across the unbridged span as cantilevers. The principal changes in assembly practice, as compared with that used when the cells are joined to make barges, etc., are to increase the size of the connection angles and to weld the corner plates to the angles. In cantilevering strings of cells, counterweight is provided by filling the rear ones with water and superimposing extra water-filled cells as required.

EXPERIENCE in applying the Navy's steel pontoon cells to a multiplicity of services (*ENR* July 27, 1944 vol. p. 106) was back of the design of two bridges built in the Solomon Islands, one with a span of 75½ ft., making use of four parallel strings of the pontoon cells lifted into place by cranes, and the other with a span of 81 ft., three cells wide, which was erected by bold and spectacular cantilevering. When the cells are put together in a single row or string, the resultant assembly looks a good deal like a steel box girder, although the designers of these structures, officers of naval construction battalions, say that they are more appropriately figured as Vierendeel girders. Both by calculation and actual test, these pontoon cell girder spans have been shown to be safe for an H-20 loading, with full allowances for wind and impact required under AASHO standards.

Erection by hoisting

As shown in Fig. 2, the 4-cell wide bridge, which was hoisted into place

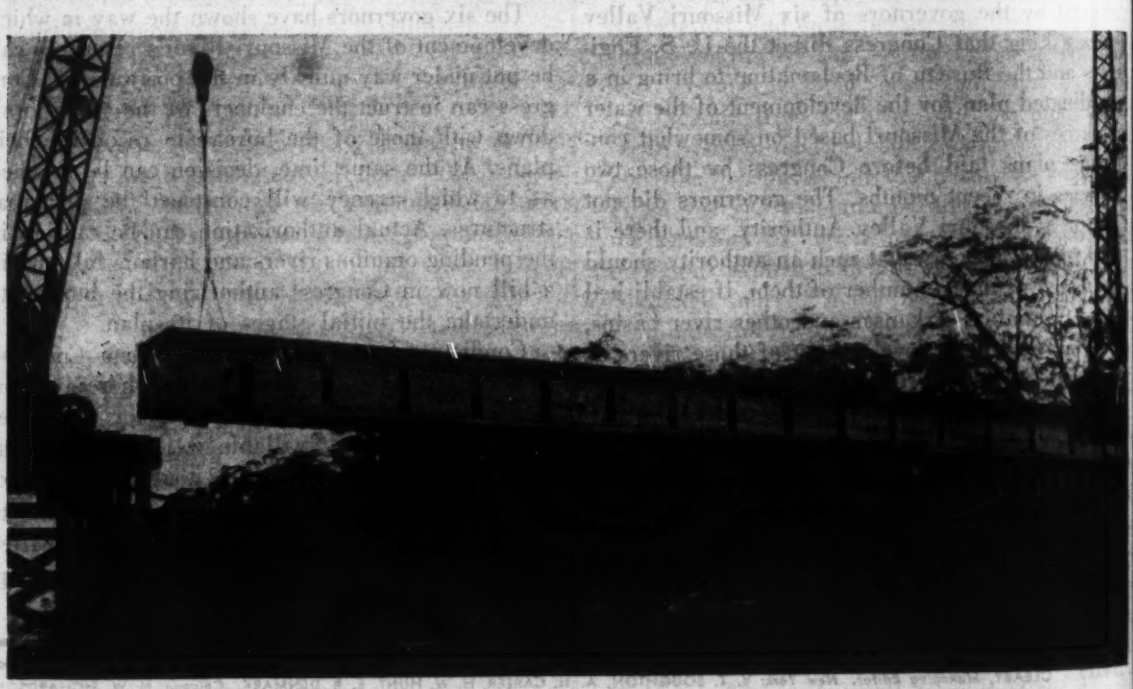
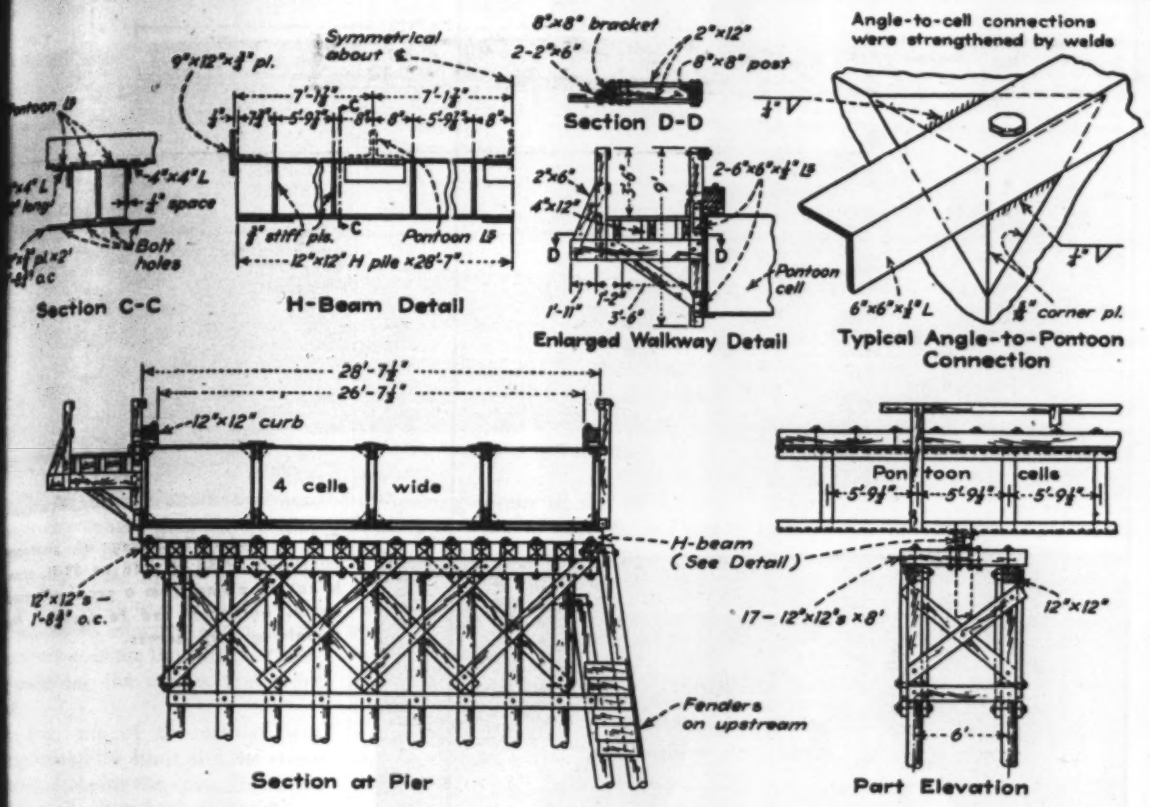


Fig. 1. Seabees lift a string of eighteen pontoon cells into position to form a girder bridge of 75 ft. main span over a stream on one of the Solomon Islands.



y crawler cranes, is made up of trings 18 cells (107½ ft.) long, which re so supported as to provide a 75½- t. center span and 14-ft. overhangs t each end. The principal concessions this special type of service for cell ssemblies was to increase the size of e angles that run longitudinally long the four corners of the strings; so to vary the angle sizes to suit the resses. Thus, 6x6x½-in. angles were ed for the first six cells, then 8x8x½ r the next six, while the third and nal group of six were 6x6x½. This sign works out in such a way as to ep the maximum stresses within al- wable limits in all portions of the ructure. At the junction of angles of fferent sizes, splice plates were put for reinforcement. Finally, as a pplement to the usual bolted-up de- gn that is considered adequate for rges, wharves and the ordinary cell ssemblies, the corner plates were elded to the angles. The objective this was to keep maximum unit resses in the angles at 15,500 lb. per in. for the condition of maximum iform load over the entire length of span.

The bridge was designed by the ff of the 5th Naval Construction Regiment under direction of Capt. A. G. Bissett and was constructed by the 44th Naval Construction Battalion, of which Commander D. F. Thomson was officer-in-charge.

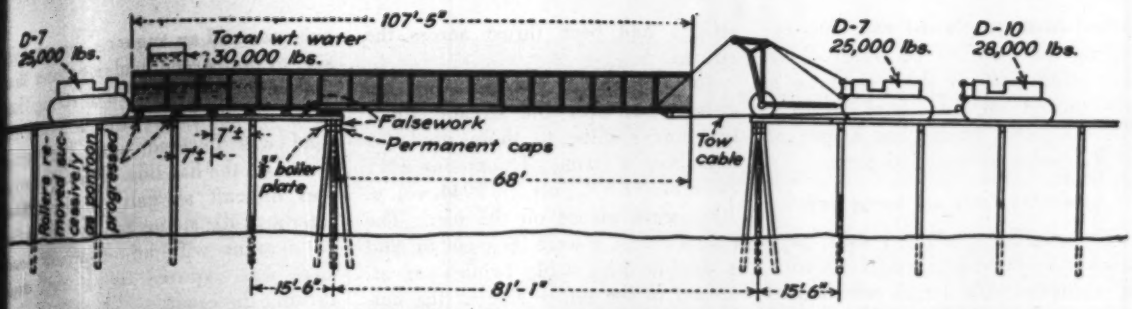
To provide adequate supports for the ends of the pontoon strings, piers consisting of selected wood piles were driven in two parallel rows 6 ft. apart, transverse to the bridge centerline. These piles were very heavily braced in both directions, each row was capped with a 12x12, and across these caps 8-ft. lengths of 12x12s, parallel to the bridge center line, formed a grillage surmounting the timber portion of the pile. To this grillage was bolted a steel plate carrying a 12-in. H-beam on which the strings of cells were landed. Batter piles were put in

Fig. 2. Structural details of the pontoon cell bridge that was hoisted into position. The bridge that was erected by cantilevering is similar, although 3 instead of 4 cells wide and of 81 instead of 75 ft. span.

Fig. 3. (above) String of pontoons cantilevered 68 ft. into an 81-ft. span, is having a line from a crane attached to its outboard end to assist it the remaining way across.

Fig. 4. Cantilevered across an edge, (as at right) the cells are turned on the flat (as shown by the two strings at the left) for service as a bridge.

Fig. 5. (left) How the completed bridge looked after a number of months of service under unrestricted loads.



6. Arrangement of pontoon cells, tractors and cranes for cantilever bridge erection. Note water load in rear cells and in one extra cell for counterweight.

the upstream side of the piers as ders.

Total weight of each of the strings be lifted bodily to place was about tons. Because these strings were siderably longer than the opening be crossed, they were floated in on upstream side of the bridge and to be lifted from a position which essitated an effective boom length newhere near the limit or overturn- point for the cranes that were d.

In fact, one of the strings was ng beyond the limit and the crane sized, dropping the span. However, crane was soon back in service, a r hold on the string of cells was ained, and the structure was kly completed as planned.

On completion the bridge was tested a 40-ton load in the form of a wler crane that moved out on the dge with one of its two tracks on h of two adjoining strings of pon- n cells. This was the heaviest load which it was expected that the ucture would be subjected. When structure passed this test satisfactorily it was thrown open to traffic, and as this was being written had been in constant service for almost two years.

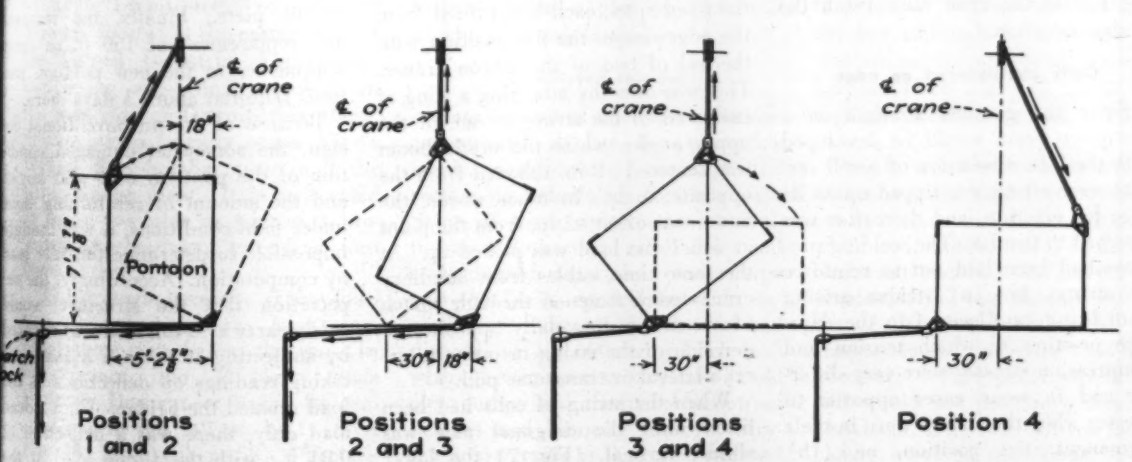
Figuring results of the 40-ton test loading in terms of stresses, and considering the load as concentrated on the eight angles, the results showed 20,500 lb. per sq. in., a slight excess over the 18,000 lb. permissible. However, this overload was only on the 8-in. angles, and the stresses on the lighter angles nearer the supports were within the ordinary limits without counting on any advantage in the extra reinforcing that was added.

Erection by cantilevering

The use of cantilever construction for the second bridge was an expedient to meet a condition of insufficient water depth to permit floating the strings of pontoons to the site. The location was one where repeated attempts to maintain a bridge on pile supports had been defeated by a succession of floods that brought down quantities of large, heavy debris. It was finally decided that the only solution was a bridge with a clear span of 80 ft. or more, and the 27th Naval Construction Battalion, Commander W. G. Triest, officer-in-charge, was called in to build it. This organization quickly devised a feasible cantilever procedure, and carried the difficult construction to completion in record time.

Description of the operation may be summarized by saying that the three strings of pontoons, one at a time, were cantilevered across the span, making use of additional weight at the rear end provided by filling with water the three stern pontoons and superimposing another on top, also filled. In addition to this weight, a rigid connection was made to the tractor used to push the string, thereby adding at least a portion of its weight as a safeguard in any emergency.

With these methods it was possible to cantilever 68 ft. of the 107½-ft. total length of the string of eighteen cells. After this much of the length had been thrust out over the span, a cable from a 20-ton crane was at-



7. Sequence of operations in turning a string of cells from the edgewise position in which it had been cantilevered into the flat position it occupies in the completed bridge.

tached to the outboard end, thus relieving the cantilevered beam of an increasing part of the weight as it was moved on into final position. The completed bridge has a span of 81 ft., center to center of piers.

Assembled from old barge cells

The available pontoon cells were in an old 6x18 barge (six cells wide by eighteen cells long) which had been in use for some months and had finally been broken up and discarded. The three best strings were selected, transported on low trailers over the highway to the bridge site and there overhauled. Seventy-five percent of the bolts were replaced because upper threads had been stripped or worn through by the rocking motion caused by wave action during the time the barge had been in service. In some cases the bolts had backed out, and 90 percent of the hand wheels used in adjustment were missing.

Five-in. welds were considered necessary in repairing more than half of the connections between the pontoon corner gusset plates and the assembly angles. Also, reinforcements were placed where necessary at the connection of the 6- and 8-in. angles and wherever welding could compensate for wear and weakness. The upper angles, which had been above the water line, had suffered a loss of section amounting to about 10 percent as the result of rusting. The lower angles, which had been below the water line, did not show severe rust effects.

As a final fabrication operation, holes were cut in the bottom and one side of each pontoon to prevent floating should the river ever reach the bridge elevation.

Cells cantilevered on edge

Since the greatest strength as a cantilever beam would be developed with the 7-ft. dimension of a cell vertical, each string was tipped up on its edge for erection, and thereafter was returned to the flat. The welding program had been laid out to reinforce the strings for (a) strains arising from being cantilevered in the edgewise position in which tension and compression stresses were very different and in some cases opposite to stresses when the strings were in their permanent, flat position, and (b) stresses set up in turning from the edgewise to the flat position after the strings had been thrust across the stream.

In preparation for thrusting the strings out over the stream, roller bearings similar to those used for launching a string of pontoons after assembly (*ENR*, July 27, 1944, vol. p. 106) were placed on the pier. The counterweights were then put on and a double ¾-in. cable bridle was attached to the under side of the outboard end for connection with a line from a tractor on the far side as an additional safeguard if anything happened to the crane that was to lift the outboard end to the pier.

The cantilevering operation

When preparations were completed, each of the three strings of cells was pushed out separately across the clear span until there was a cantilever overhang of 68 ft. (In one case this overhang was extended to 71½ ft., although this is not recommended as desirable.) At the 68-ft. point a line was passed from the high boom of a 20-ton crane on the far pier to the outboard end of the string, and a lift of about 6 tons applied. As the string advanced farther, more of the load was taken by the crane until the end of the string reached the pier. Thereafter the crane was walked backward until the string was centered on the two piers.

The first string was put across the span in about 90 min. from the start of the operation. The third string was placed in 11 min., indicating the speed-up resultant from experience gained in the first two cantilevering operations.

When the three strings were across the open span, each was turned from the edgewise to the flat position with the aid of two of the 20-ton cranes. This was done by attaching a sling at each end of the string to one of the upper angles while the crane boom was centered 18 in. inboard from the opposite angle. In other words, the boom was offset 42 in. from the point at which the load was picked up. At the same time, cables from auxiliary cranes were fastened through snatch blocks to the diagonally opposite under side of the string in order to exert a lateral or transverse pull.

When the string of cells had been lifted until the diagonal axis was almost vertical, (Fig. 7) the lower cables were tightened, pulling the under edge laterally until the diagonal axis assumed an angle on the opposite side of the perpendicular greater than the angle to which the string had been lifted. From this position the load was lowered until the string rested on the flat side. This operation was difficult as half of the 29-ton weight of the string had to be carried by a crane with an off-center load. Care was required to prevent overturning the crane.

Final alignment

When the strings were finally in place it was found that there was a slight variation in deflection or camber of the individual strings. Damage suffered during their service in the barge had left them out of alignment, longitudinally, as much as 4 or 5 in. Remedial measures were limited to fastening the corner angles together by tie rods and by links and pins where possible. Where deflection was irregular no effort was made to align the strings vertically as it was considered inadvisable to introduce unnatural stresses of compression or tension into the construction. Instead, cover plates were welded on to lock the strings in the position they had assumed under dead load.

The total time required for putting in the new bridge by this method amounted to 11 days. Of this total 2½ days was devoted to removal of the old structure and clearing away debris which had collected on the upstream side. Some 3¼ days was used driving the pier piles and the repair of eight damaged bents. Then 2¼ days was consumed in actual placement of the pontoon strings including the removal of falsework on top of the piers. Finally, the removal and replacement of 150 ft. of ramp approaches to the new pontoon sections required about 3 days more.

Because of the unconventional design, the somewhat damaged condition of the pontoon cells and angles and the amount of reinforcing done under field conditions, it was thought impossible to determine the safe load by computation. Accordingly, the expectation that the structure would safely carry a 45-ton load was checked by subjecting it to such a load and taking readings on deflections as the load crossed the bridge. Under dead load only, there was a deflection of 0.04 ft.; with the 45-ton load at the center of the span the deflection was only 0.14 ft.

Open cuts 300 ft. wide and 18 ft. deep were required for the depressed section of the Detroit Expressway.

Depressing a Highway in Unstable Soil

***Contents in Brief**—Earth slides and sloughing of material in open cuts impede construction progress on the depressed sections of the Detroit Industrial Expressway. Removal of excessive ground water and disposal of excavated material are major items of the work.*

EVERYTHING from tin cans to old bedsprings was encountered in excavating the 1.6 mi. stretch of depressed highway located at the eastern end of the Detroit Industrial Expressway. Connecting with Michigan Ave. on the west side of Detroit, this 16-mi. limited access freeway serves Ford's Willow Run bomber plant and the River Rouge plant. It is so located as to be available as part of a projected superhighway extending west from Detroit.

The strategic necessity of this four-lane divided expressway was recognized some time before the war. In consequence, the Michigan State Highway Department began its construction in the fall of 1941 (*ENR* Jan. 14, 1943, vol. p. 58). The entire western 14.4 mi. is either at grade level or slightly elevated, with cross roads and grade interchanges passing beneath the main highway. The depressed easterly end of the freeway forms a part of Section 3 which is 5.8 mi. long.

Completed this fall

Despite several adverse conditions encountered during the past few months completion of the depressed section is scheduled for late fall. Some of these construction difficulties are: Bothersome small slides and sloughing of material on some large cuts that were opened last fall, excessive groundwater, the removal and disposal of 150,000 cu. yd. of spoil where the expressway traverses an old city dump, and the construction of detours and "shoofly tracks" carrying heavy traffic around nine railroad and highway underpass bridges now under construction.

There were several reasons why the Michigan State Highway Department decided to depress this last stretch of highway instead of making it elevated as had been done on that previously constructed. Availability of embankment material was one of the most important considerations. Heavy embankments would have been necessary for the expressway to overpass the five railroads in this area since they are carried on fills of appreciable heights. Four highway grade crossings also would have had to be overpassed.

Ample waste areas were available within a 3-mi. haul for material excavated from the depressed section, while on the other hand, suitable embankment material was scarce, being obtainable not less than 10 mi. from the job. The low bearing value of the supporting soil indicated that the fill necessary would progressively settle and would not provide a stable embankment. This was proven later by chance overload conditions.

Other deciding factors in depressing the road section were that it would give positive control over the

Spring thaws and excessive rains caused numerous small slides in some cuts which were opened last fall.

limited access for which the road was designed, while at the same time causing less economic damage to abutting property. On previously constructed sections of raised roadway it had been found difficult to limit the access to designated locations. There had been occasional instances where cars gained access to the expressway indiscriminately — protective guard cables being cut by motorists to gain this objective.

Besides avoiding the unsightly fill necessary for a raised grade, the depressed section required a minimum width of right-of-way. The deepest cut, which is 18 ft., has a top width of only 300 ft. Minimizing the width of right-of-way was of decided importance since a large portion of the depressed section traverses an area of potential industrial importance. In the light of these controlling influences, construction of the last 1.6-mi. stretch of Section 3 as a depressed highway was the only logical conclusion.

Starting at zero grade just north of the "trumpet" interchange connection, so-named by virtue of its resemblance to a trumpet, which leads to Gate 10 of the Ford Motor Company's River Rouge plant, the expressway is depressed gradually until it passes beneath a branch line of the New York Central Railroad. It continues in a fully depressed section for nearly a mile, passing under four railroad and three highway bridges now under construction.

From this point the eastbound expressway is brought up to zero grade and a temporary connection made with Michigan Ave. near its intersection with Wyoming Ave. When the crosstown expressway is completed after the war this temporary connection will be replaced with a continuation of the depressed section passing under Michigan Ave. and connecting with the crosstown expressway.

The westbound expressway takes off from Michigan Ave. near Wyoming Ave., swings out and passes beneath a bridge, now under construction, which will carry Michigan Ave., and on west to connect with the fully-depressed highway. A turnoff ramp also is being provided from the eastbound expressway to connect at grade with Wyoming Ave. which crosses Michigan Ave. nearly at right angles. This turnoff is designed to prevent a left turn off of the eastbound expressway at Michigan and Wyoming avenues.

Combatting the groundwater

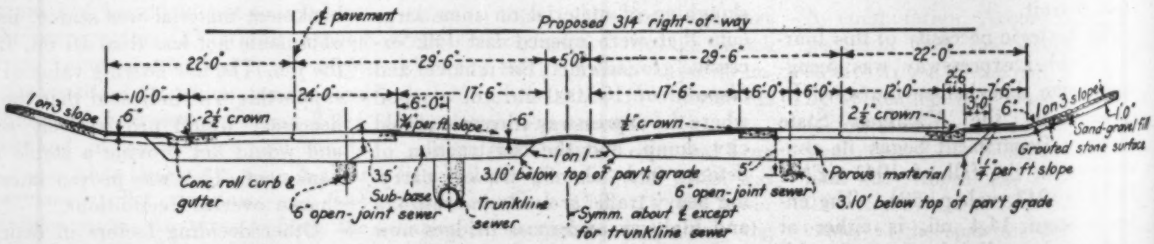
Disposal of existing groundwater during construction was a major problem. Due to a wet season last fall and this spring, the groundwater table was abnormally high—nearly reaching ground surface. Much of the depressed section traverses porous material in an old city dump extending some 16 or 17 ft. below ground.

This meant that when a cut was first started on any section of road the groundwater from the surrounding territory had to be drained out until its level was lowered to the bottom of the porous material. The usual procedure in such instances was to install a battery of pumps as soon as water was encountered and dewater the entire adjacent area as necessary, while the cut was deepened.

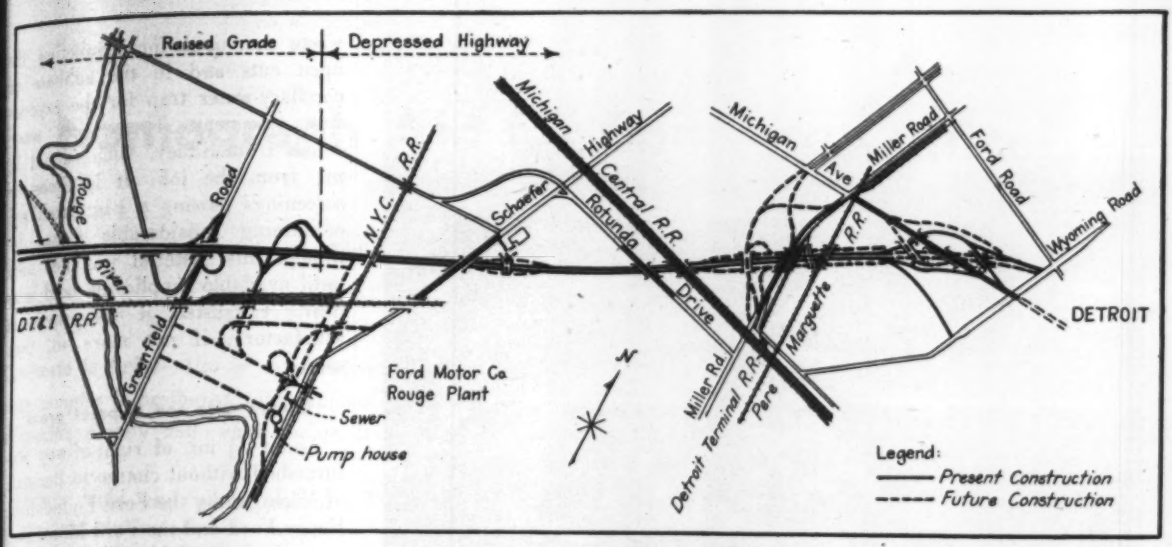
The water was carried to city sewers by previously constructed drain lines, augmented by open ditch where feasible. After the groundwater table had once been lowered, it was not too difficult to keep successive cut sections in the dry, although some pumping was necessary at all times.

Slides and sloughing

Considerable sloughing and numerous small slides occurred last spring in some of the large roadway cuts which were made during the fall. Due to the unpredictable action of the open-cut banks when subjected to spring thaws, surface ditches only were provided along the top of cuts



Sand subbase and collector drains give positive drainage of the depressed highway. Large cuts have an additional drainline at the toe of each cut slope.



Scheduled for completion by October, the depressed section of highway forms the final link in the 16 mi. of expressway.

at the time they were being opened, with positive drainage lines being installed later where required.

Most of the area traversed by the depressed highway has a sandy top soil varying up to a 4-ft. depth. A brown clay extends from 4 to 8 ft. below ground line, underlain with blue clay extending on down some 80 ft. It is this brown clay with laminations of silt and very fine sand, which was subjected to sloughing and sliding when freezing weather opened the cracks in the laminations, followed by spring thaws that lubricated the mass and made it unstable.

Drain lines for bank stabilization could not be installed efficiently until the cuts had been opened since the brown clay feathers into the blue clay at widely varying depths and the proper location of drain lines was unpredictable.

The blue clay is a very fine, silty, lacustrine material, not subject to sloughing. In fact, it is so gummy when wet, and so caked when thoroughly dry as to be unfit for embankment material. All excavated blue clay was wasted off the right-of-way. The brown clay contains some life which will support vegetation and it can be pulverized easily when dry. It will be replaced along the cut banks to carry a layer of top soil for the sod.

Sloughing of the cut banks is not considered serious, and corrective measures are being taken to stabilize them. Any one of three methods has been found to be successful—the choice depending on type of soil and other conditions encountered.

Where depth of cut is not excessive or where the bank is sufficiently stable to permit deep trenching, a line of open-joint clay tile drains is placed in the bottom of a trench dug just outside of the upper slope stakes and extending down to slightly below grade line of the roadway pavement. For deeper cuts or in less stable material two lines of drains are placed in each face of roadway cut—one placed in a trench just outside of the top slope stakes but extending down only to the mid-depth of the cut, and the other placed in a trench excavated from a point half-way up the slope and extending down to a point slightly below roadway grade line. In both cases the trenches are backfilled with porous material to intercept the groundwater and carry it down to the collector drains which empty into the roadway side drains.

The third method of slide prevention is to remove about 18-in. of the sloughed earth from the face of the cuts and replace it with a blanket of sand or screened quarry waste.

City dump used for disposal area

The 80-acre city dump through which the depressed highway passes was used to good advantage as a waste area for usuable blue clay and "alley spoil" from the refuse dump. It was purchased by the state as a part of the right-of-way and it will be turned back later to the city for recreational development. All material disposed of on the dump will be leveled and top-dressed.

Incidentally, excavating within this area was considerably more difficult than the ordinary earth-moving job. At some locations the "alley spoil" extended to a depth of 10 ft. Heavy equipment was required to remove this debris and the water-soaked clay. Most of the cut for the outlet of the main highway leading to Michigan Ave. was made by dragline which deposited the spoil at the top of the cut where it was bulldozed away. Excavation of the outlet connection to Wyoming Ave. was by large tractor-drawn scrapers, using a pusher tractor where the going was heavy.

Excavating a typical cut

Typical of the excavation in the depressed section of the expressway was that encountered in the 2,000-ft. long open cut between Miller Road and the Michigan Central R. R. main line bridge. Some 300,000 cu. yd. of excavation was removed from this one section, which is 300 ft. wide at the top, 18 ft. deep from original ground to top of expressway pavement, with conventional cut slopes of 1 on 3.

Five lines of longitudinal drains provide drainage for cuts such as this one. A line of 6-in. open-joint clay tiles is placed at the toe of each cut slope, one 6-in. tile underdrain is at the centerline of both the eastbound and westbound pavements, and a trunkline sewer of varying diameter is located near the centerline of the expressway. Trunkline sewers carry the stormwater to pumping stations from where it is pumped either

Heavy excavation was encountered in an old city dump. A dragline works on the eastbound lane (at top) while tractor-drawn scrapers (at bottom) excavate for the turnoff ramp.

into the city sewer system or directly into the Rouge River.

All top soil within the cut-section area was removed and stockpiled nearby, to be used later on the cut slopes. The brown clay also was removed and stockpiled for reuse later. But the "alley spoil" and unusable blue clay were wasted either on the old city dump or waste areas furnished by the Ford Motor Co.

Protecting the cut-banks

In general, the side cuts were over-excavated to permit the placing of a 3-ft. layer of porous material, topped by a 3-ft. layer of clay, which will carry a 6-in. layer of top soil for seeding. The layer of clay will serve as a blanket for the porous material which stabilizes the open cuts. This porous material will collect groundwater and carry it down into the collector drains at the toe of slope.

Original plans contemplated extending this layer of porous material from toe of slope to original ground line. When cuts were opened, however, the upper half of the exposed natural material was found to be so porous that groundwater percolated down and seeped out near the bottom of cut. Consequently, the layer of porous material was extended only half-way up the cut slopes, resulting in a substantial reduction in the amount of porous material. The layer of clay, however, extends from top to bottom of cut as per original plans.

Both sand and limestone quarry waste are used for blanketing the open cuts and in the subbase or capillary-water trap for the expressway pavement. The quarry waste comes from Sibley, Mich., about 12 mi. from the job. It is limestone screenings passing a ½-in. mesh and containing considerable fines. Although this material was not used until available supplies of sand were nearly exhausted, it has proven as satisfactory, if not more so, than sand.

Borrow pits and disposal areas

About 3½ mi. of right-of-way was furnished without charge to the state of Michigan by the Ford Foundation, Henry Ford and the Ford Motor Co., owners of a considerable portion of the land traversed by the industrial expressway. In addition, an agreement was made with these three interests by which the state secured free sand borrow and permission to waste excavated material at designated locations.

Most of the sand was located within ½ to 4 miles of the job, and disposal areas were located within a 3-mi. haul. While the dump areas were in such remote locations as to obviate the necessity for special treatment other than orderly dumping of the material, borrow pits had to be left in a presentable condition. The usual procedure was to strip the soil, remove the sand which extended not more than 8 ft. deep, backfill with clay soil and replace the top soil to a uniform contour. One borrow pit, covering 40 acres, yielded 300,000 cu. yd. of sand.

Engineering personnel

Included among the Michigan State Highway engineers in charge of constructing the Detroit Industrial Expressway are: Harry C. Coons, deputy commissioner-chief engineer; Scott A. Baker, acting construction engineer; C. H. Brown, acting metropolitan engineer. Road project engineers on the depressed section of highway include: A. W. Kerchoff, H. J. Brighton, M. Weese, E. T. Carmody, W. D. Theeringer and W. W. Dalzell.

Charles M. Zeigler is state highway commissioner, and L. P. Scott, senior highway engineer represents the Public Roads Administration, which is paying 75 percent of the cost of the work.

Nomograph Aid for Concrete Control

Benjamin Janer,
Testing Laboratory, Department of Borough Works,
Borough of Manhattan, New York

Contents in Brief—Use of a nomographic chart in analysis of fresh concrete samples is presented with explanation of the chart for determination of specific gravity and, when sp. gr. is known, the free moisture content.

EFFECTIVE field and plant control of concrete during the course of construction requires periodic checks and corrections on the batch weights of the aggregates and the measured water if a reasonable degree of uniformity in the quality of the concrete delivered to the job is to be maintained. From time to time it also is advisable to make an analysis of a sample from a mixed batch to determine whether the material being placed is in adequate compliance with the mix design in regard to cement content and water cement ratio.

Several methods for such analysis have been suggested, the simplest and most direct being that of W. M. Dunnigan. ("A Proposed System for the Analysis and Field Control of Fresh Concrete," *Bull. 113*, Iowa State College, Engineering Experiment Station, 1933.) The computations from the observed data in such determinations and analyses can be greatly expedited by the use of the nomograph described herein.

It can be readily shown that

$$G = \frac{S\,(1 - h)}{S\,(1 - h) - W} \quad \ldots\ldots \text{(Eq. 1)}$$

which:

G is the bulk specific gravity of an aggregate in the saturated surface dry condition (as defined in American Society for Testing Materials, *Standards Part II*, 1942, C127, C128 and E12; for cement, G would be the specific gravity as defined in ASTM C77).

S is the weight in grams of sample in its condition as is.

h is the free surface moisture, expressed as a fraction of the sample S, as defined in ASTM C70 or by Dunnigan. (This quantity may be positive, corresponding to moisture in excess of that required to render the aggregate saturated and surface dry and thus available to the cement; or it may be negative, corresponding to a lack of sufficient moisture or absorption by the aggregate as defined by Dunnigan.) h times 100 equals percent

W is the immersed weight of the sample S in grams.

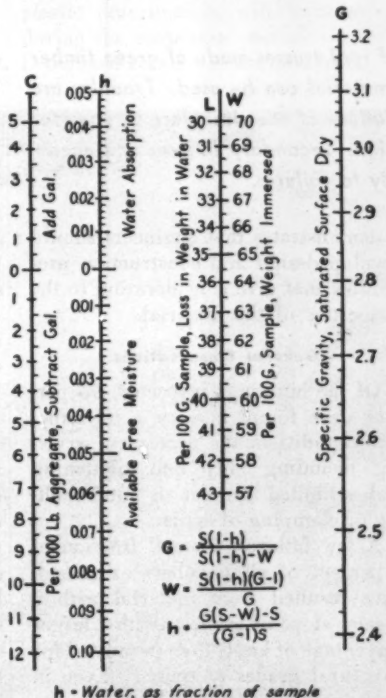
From Eq. 1, by simple transformations, we have

$$W = \frac{S\,(1 - h)\,(G - 1)}{G} \quad \ldots\ldots \text{(Eq. 2)}$$

$$h = \frac{G\,(S - W) - S}{(G - 1)\,S} \quad \ldots\ldots \text{(Eq. 3)}$$

The solution of any of these equations can be performed rapidly by means of the nomograph. This is best shown by illustrations.

Example 1—Sand from a new source is to be used and the value of G is sought. Proceeding as per ASTM C128, the sample is rendered saturated, surface dry and 500 grams of the prepared sample is weighed in water; weight is found to be 310 grams. For this purpose h=0 and a straight edge from the h scale at 0 through W=62 (310÷5) and continued gives on the G scale the bulk specific gravity, saturated surface dry, 2.63.



h = *Water, as fraction of sample*
C = *Correction for water*

Nomograph speeds analysis of fresh concrete samples and is useful in rapid determination of free moisture of aggregates.

Example 2—A pile of coarse aggregate, crushed granite, has been exposed in the hot sun; it is now to be used in concrete and the value h is needed. A prior determination has established the value of G to be 2.71. A 2,000 g. sample from the pile is immersed in water for 10 minutes. It is assumed, as per Dunnigan, that in that time the aggregate will absorb water to the extent of about 80 percent of that required to render the material saturated, surface dry. The immersed weight of this sample is now found to be 1,272 g. A straight edge from the G scale at 2.71 through the W scale at 63.6 (1272÷20) crosses the h scale at—0.0064 and so h=—0.008 at saturation (0.0064 ÷0.80). Thus, this aggregate will absorb water from the batched water to the extent of 0.8 percent of its weight. If time permits it is better to allow the sample to soak for 24 hours to saturation instead of guessing at the 80 percent saturation in 10 minutes.

Example 3—A barge load of wet sand, just delivered, is to be used at once. Sand from this source is known to have a value for G=2.61; h is to be found. Proceeding according to ASTM C70 or any other appropriate method for finding the immersed weight or for measuring the corresponding volume of water displaced, a 1,000 g. sample of the sand is found to have an immersed weight of 590.5 g. or to displace 409.5 cc. of water. A straight edge between G at 2.61 and W at 59.05 gives at once, on the h scale, the free available moisture 0.043 or 4.3 percent.

Example 4—From the data in Examples 2 and 3 the corrections in the volume of water to be measured into the concrete batch can be computed graphically. Assume the mix design for a 5-yd. batch calls for 27.5 bags of cement; 5.1 gal. of water per bag or 140 gal. per batch; 6,950 lb. of sand and 10,150 lb. of the coarse aggregate, both based on saturated surface dry weights.

A straight edge horizontally placed at the appropriate values for h gives, on the C scale, the required corrections in the water volume. Thus, for the fine aggregate h=0.043, C=5.2; −5.2x6.95 (7 usually will be close enough)= −36.14. For the coarse aggregate h= −0.008, C=0.95; 0.95 x 10.15=9.64 The volume of water to be used for the batch thus is 140 −36.14 + 9.64 = 113 gal., as rounded off.

Corresponding corrections must, of course, be made in each of the aggregate weights; in this example the correction is plus 300 lb. for the sand and minus 80 lb. for the coarse aggregate.

Example 5—For this example the data assumed are those on pages 16 and 17 of the Dunnigan report, *Bulletin 113* of the Engineering Experiment Station, Iowa State College. The weight of the fresh concrete sample is 4350 g. For the cement, G=3.15 and the immersed weight of the cement in the sample is 373 g.; at h = 0 and G = 3.15 the immersed weight per 100 g. of cement by scale W is 68.25 g.; hence the weight of cement in the sample is (373 ÷ 62.3) x 100 = 546 g. Similarly, for the fine aggregate, G = 2.65 and the immersed weight of the sand in the sample is 761 g.; at h = 0 and G = 265, the immersed weight per 100 g. of sand is W = 62.3 g.; hence the weight of sand in the sample is (761 ÷ 62.3) x 100 = 1223 g. Finally, for the coarse aggregate the data give G = 2.56 and the immersed weight is 1390.5 g.; by the chart at h = 0 and G = 2.56, W = 61.05 per 100 g.; hence the weight of the coarse aggregate in the sample is (1390.5 ÷ 61.05) x 100 = 2280. The water content is obtained by difference, namely 4350 − (546 + 1223 + 2280) = 301 g.

As familiarity with the chart increases other applications readily suggest themselves. The principles applied in constructing this chart are fully treated in *Empirical Equations and Nomography*, by D. S. Davis, McGraw-Hill Book Co., 1943.

Acknowledgment is hereby gratefully recorded to Hon. Walter D. Binger, Commissioner of Borough Works, for permission to publish this report.

Green Timber for Structural Use

Glenn B. Woodruff
Consulting Engineer, San Francisco

Contents in Brief—The service record of roof trusses made of green timber demonstrates the success with which this material can be used. Troubles are caused not by green timber but by (a) failure of the designers to consider its properties and (b) outright faulty design. Secondary stresses and eccentricities are factors that contribute heavily to failures.

TRUSSES built of green timber will prove entirely satisfactory provided they are properly designed and constructed and receive a reasonable amount of servicing in the first year after their completion. This statement is based on inspection, stress analysis and direction of repair on about 500 buildings with timber trusses ranging from 20 to 200 ft. in span. Most of them were built within the past two years.

This experience indicates that 95 percent of the trusses have served their purpose admirably. With the exception of a surprisingly few failures (caused by timbers which should have been rejected as unsuitable for structural use), such troubles as have been experienced in the other 5 percent are a direct result of faulty design. If this experience, all on the West Coast, is typical of that throughout the country, it demonstrates that engineers should develop design and construction procedures that give consideration to the properties of the material.

General Observations

Of the buildings inspected, 95 percent were found in very good structural condition, the necessary servicing including only bolt tightening and a limited amount of stitch bolting or clamping of splits.

A few failures, a small fraction of 1 percent of all members examined, have resulted from material with a greater slope of grain or with a larger percentage of knots than permitted for structural grades of timber. Even in these cases, relatively high stresses usually have been a contributing factor.

A few failures have resulted from improper fabrication and the omission of connectors. There are reasons to believe that the latter factor is fairly common and that there are many cases where joints designed for connectors are held only by bolts.

The amount of end splitting of members bears a relation to the stress in the member, that is, it occurs more frequently in tension than in compression members and is more pronounced (a) when the stress is applied at an angle to the grain and (b) when end and edge distances are substandard. In many cases, the amount of end splitting is negligible.

There generally is considerable splitting in the case of wide members, especially those with multi-connector details and members connecting at an angle. The usual explanation is restraint during the shrinkage period. It may also be explained by the high secondary stresses that accompany short, wide members and produce high longitudinal shearing stresses. The author believes the latter explanation the more valid of the two. He knows of several structures with 14-in. chords, built of material so green it was "dripping," with considerable

ss grain restraint but with long els, in which the amount of fitting has been negligible

In general, bolts can be tightened re than can be explained by the rinkage of timber. For example, on ildings constructed in 1937-1938, bolts were tightened in the winter 1939-1940. In a recent recheck e same bolts, which have an aver- grip of 14 in., were tightened 1 in. ddition to shrinkage, takeup in bolts may result from: (a) grad- removal of warp from contact faces, (b) transverse compression the timber, (c) progressive indenta- n of washers.

Review of designs

In cases where excessive sag of ses, an unusual amount of splitting failure of truss members were ob- ved an analysis has been made of stresses in the trusses. In all cases, thout exception, this analysis de- oped the reasons for the failures ich may be classified as follows:

rors in stress calculation—com- paratively few.

proper analysis of stress transfer through the connectors.

standard spacing and substandard nd and edge distance for con- ectors.

centric connections.

lure to recognize that green timber ill shrink.

lure to provide splices capable of esisting bending moments in mem- ers subjected to the combination f direct stress and flexure.

Secondary stresses

Unless the ratio of width (in the e of the truss) to length of a truss mber is kept to a comparatively value, high secondary stresses re- . Many designers have failed to sider this fact. Trusses with 14-in. rds, 12-in. diagonals and 5-ft. ls are common. The high sec- ary stresses from truss deflection duce exceedingly high stresses in connectors and high longitudinal r in the members. Such trusses riably develop an extreme amount plitting.

sses from eccentricity of detail

kin to these secondary stresses are resulting from eccentricity of il. Such details can usually be ded but when used (most often means of reducing costs) the re- sulting stresses should be analyzed.

If it were practicable for the timber industry to deliver material all dried to a uniform moisture content, surfaced to uniform dimensions after drying, with all checked material rejected, at the same price and meeting the same delivery dates as green material, there would be little reason for using green material. However, even in peacetime, these conditions do not obtain on the Pacific Coast. Generally, material for large projects is sawed and surfaced from mill orders, loaded from the planer and fabricated upon delivery. Therefore, the designer faces the probability that green material will be used.

As compared with seasoned material, green timber has somewhat lower strengths and a lower modulus. In this latter respect, the author has no definite information as to the relative amounts of elastic and plastic deformation but believes the latter accounts for a large amount of the difference. With reduction in moisture content, transverse shrinkage occurs. In trusses built of green timber:

1. The deflection for the same load will be considerably greater than for dry material and, because of plastic deformation, will increase during the seasoning period.
2. If the members are restrained from transverse shrinkage, splits will occur.
3. As the timber shrinks, it is necessary to tighten the bolts periodically in order to maintain contact that will insure efficient joints. Designs should provide access for this purpose.

Green timber has the advantage that the greater amount of plastic deformation gives a better chance for more uniform distribution of stress within the members and in joints, and of relieving stresses resulting from deflection and imperfect fabrication.

Conclusions

All structural materials have certain advantages and certain drawbacks, which should be considered in design and construction. Failure to consider all the properties of any material may lead to trouble. None of the objections to the use of green timber are such that they cannot be overcome by using reasonable precautions. For many structures, it is the most economical material available.

[On page 60 of this issue is published a "Letter to the Editor" in which Mr. Woodruff discusses an article on this subject that appeared in *ENR* July 27, 1944, p. 110—THE EDITORS]

Timber trusses have failed through omission of connectors during fabrication.

Beginning . . . 13 Pages On Sanitation Developments

War-Inspired Sewage Disposal Plant Will Provide Postwar Benefits

Contents in Brief—*Wartime demands for sewage treatment facilities at Norman, Okla., required the construction of a disposal plant to serve both the city and three large Naval training units. Primary sedimentation with supplementary chemical treatment were furnished, with provisions made for secondary processing to be added after the war.*

INCLUDED AMONG THE MANY war-necessitated installations which will continue in peacetime operation to benefit municipalities is the recently completed sewage disposal plant at Norman, Okla. Prior to the war all domestic sewage from that city including the University of Oklahoma and the Central State Hospital, representing a total population of 21,500, was discharged untreated through two outfall sewers into the South Canadian River.

The construction of three large Naval installations—an airbase north of the city, and a service school and hospital to the south—increased to 43,000 the total population to be serviced by the existing collector system. The South Canadian River has no flow during dry seasons, despite a drainage area above Norman of 26,700 sq. mi., making the need of a sewage treatment plant apparent.

Surveys were begun in the summer of 1942, plans were drafted, and a contract was let in August 1943 for construction of the disposal plant and all necessary intercepting and collector sewers. The plant was put in operation on June 5 of this year.

Situated on a plot of ground 660 ft. square, in one corner of a 140-acre tract of city-owned property, this $194,000 sewage disposal plant is designed for a capacity of 100 gal. per day per capita with a 2-hr. detention period in the clarifiers. Sludge digesters have a capacity of 3 cu. ft. per capita and sludge drying beds provide an area of 1 sq. ft. per capita.

Due to wartime restrictions on critical materials and the lack of city funds to finance complete treatment facilities, the present plant is designed for primary processing only, with secondary treatment to be added after the war. The new facilities consist of a control house, chemical and sludge pumping equipment, screen chamber and flume, an agitator well, two primary clarifiers, two digesters, sludge beds and several thousand feet of outfall sewers.

All the sewage flows by gravity to the disposal plant which is located at a substantially lower elevation than the of the city of Norman or the naval installations. Also, the effluent from the plant flows by gravity through some 3,400 lin. ft. of 27-in. vitrified clay outfall sewer into the South Canadian River.

The two existing outfall lines serving Norman are located on either side of the city. The west line serves about 75 percent of the city as well as the Naval Air Station. The east line serves 25 percent of Norman, the University and the state hospital. An existing 24-in. outfall sewer also had been installed, paralleling the east line, to serve the Naval service center and hospital.

Two plants planned originally

During preliminary investigation consideration was given to the construction of a separate disposal plant

Fig. 1. Primary sedimentation, chemical treatment and sludge digestion are provided by the Norman, Okla., disposal plant

each of the city's outfall sewers hich empty into the river about a le apart. This would have elimin- ed the cost of a large intercepting wer. In the final analysis, however, d considering the greatly increased st of constructing and operating o separate installations, it was de- ded to collect the sewage and bring o one large plant located on the east tfall line. This necessitated the con- ruction of 9,270 lin. ft. of 24-in. trified clay tile intercepting sewer om the disposal plant to the west tfall sewer line.

Two 24-in. outfall sewers discharge to the screening chamber located jacent to the control house. One is e interceptor line from the west out- ll sewer while the other passes sew- e from the city's 18-in. east outfall e and the 21-in. line from two of the val installations. The screen cham- r is equipped with a structural steel reen of 2x$\frac{5}{16}$-in. bars spaced 2 in. centers.

Chemical treatment facilities

Raw sewage flows from the screen- chamber through a 12-in. concrete rshall flume into a 15-ft. dia. circu- ory agitator well. Hydrated lime, n sulphate and chlorine are added the raw sewage ahead of the screen- basin. Provisions also were made final chlorination of the effluent, t that has not been necessary to e.

During a typical summertime run en the plant is treating 3,800,000 per day the amount of chemicals ng used daily include: 125 lb. of orine, 150 lb. of lime and 170 lb. iron sulphate. Under present con- ions the operational load on the nt varies from a minimum of 1,- 0,000 to a peak load of 5,000,000 per day. With the raw sewage raging 550 ppm. solids it is pos- e to secure an effluent containing 30 ppm.

small tile-brick house, 14$\frac{1}{2}$x31$\frac{1}{2}$x ft. high, provides storage space for dry chemicals, while one end es the automatically controlled mical feeders. Chemicals are fed the raw sewage through rubber ng which is protected under- nd by tile conduit. All chemical ling equipment is governed by a t meter control in the throat of the shall flume. Such automatic con- is particularly desirable because e abrupt changes and wide varia-

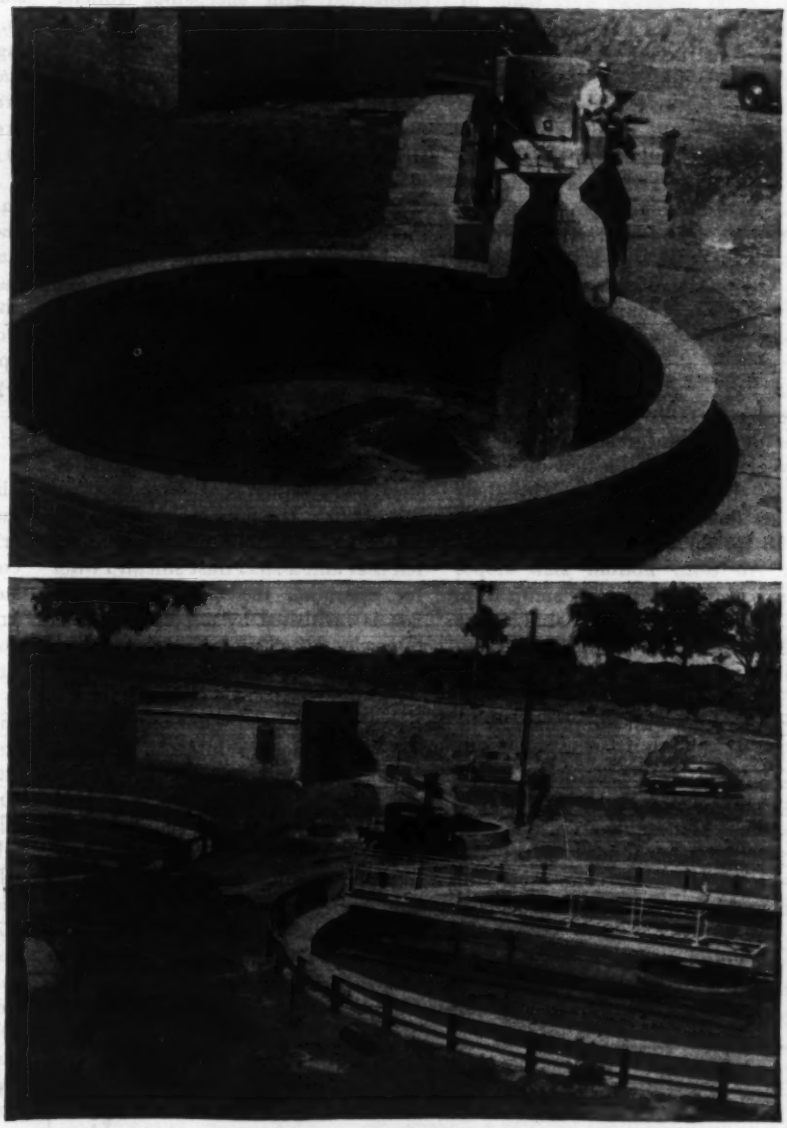


Fig. 2. Raw sewage flows through a concrete Parshall flume into a circulatory agitator well (top), which serves to disperse the chemicals. From the well the chemically treated sewage passes to the primary clarifiers (below).

tions in the volume of sewage reaching the plant.

A sharp drop in the volume of sewage received at the plant is noticed when the several thousand Naval trainees at the nearby service school are out on maneuvers. Coincident with their return to barracks there will be a sudden and abrupt increase in the volume of flow.

Substitute materials used

Despite the plant being constructed as an emergency wartime project, under an AA3, or better, priority rating, substitute materials were used instead of critical metals wherever possible. Thus creosoted treated timber was used for the screening platform, and treated timber stop-logs and frames replace the usual steel gates controlling the flow of sewage from the agitator well to the primary clarifiers.

Stairs in the sludge pumphouse are of timber instead of steel and treated timber posts with painted timber handrailing were substituted for pipe railing around the clarifiers. The grease baffle in the agitator well also is of creosoted timber, as are the side walls of the sludge beds. The tops and rings

for some 60 manholes were made of concrete instead of cast iron or steel.

Brick construction is used throughout the 15-ft. dia., 7-ft. deep agitator well except for an 8-in. concrete base slab. Walls are 13 in. thick. A 16-in. cast iron pipe leads from the well to each of the two clarifiers, a 21-in. clay tile bypass line connects to the effluent line and a 6-in. tile sewer line carries collected grease to a grease burner. An 8-in. vitrified clay tile provides a return for the supernatent from the digesters.

Primary clarifier details

Duplicate 60-ft. dia., 8½-ft. sidewater depth, reinforced concrete primary clarifiers are located on either side of the agitator well, with their tops set flush with the ground. Walls are 18 in. thick on 3½-ft. wide footings. An 8-in. bottom slab slopes down 1 on 12 to a central sump from which an 8-in. cast iron sludge line leads to the sludge pumphouse. Effluent lines of 21-in. vitrified sewer pipe lead to a brick-lined effluent well, which connects with the plant's 27-in. outfall sewer line. A ¾-in. asphaltic expansion joint is provided between the circular wall and the bottom slab. Concrete was designed for 650 psi., reinforcing steel design stress was 30,000 psi. in the circular wall ring steel, and 20,000 psi. for the remainder.

Following excavation for the clarifiers, and prior to placing the bottom slab, the supporting subsoil was well compacted with sheepsfoot rollers. Backfill outside of the walls also was compacted in this manner. A total of 60,000 cu. yd. of excavation were required to level the plant site, excavate for the various structures and to construct a service road that encircles the plant and sludge drying beds.

Equipment within the two clarifiers includes a rotating central driving mechanism supporting a center drum with two rake arms attached. Rake arms are equipped with blades to scrape the settled sludge into the central sludge pocket. A circular steel column is mounted over the influent line at the center of the tank. Turntable base and top are of high-test cast iron and the top rotates on alloy steel balls which bear on hard steel liner plates. The supporting balls run in an oil base and are protected by a felt seal and a steel dust shield. Power for operating the clarifier mechanism is furnished by a ¾ hp., 3-phase, 60-cycle, 220-v. motor equipped with automatic starter and overload alarm.

A 6-in. cast iron scum drain delivers accumulated scum into a 48-in. dia. 12-ft. deep reinforced concrete well connected to the sludge pumps. All interior concrete surfaces of the agitator well, clarifiers, scum well and digesters are covered with three coats of waterproofing paint to protect the concrete.

Duplicate sludge pumps of 175 gpm. capacity under a 30-ft. head are enclosed in a compactly designed 15-ft. dia., 2-story pumphouse. The lower story sets below ground. It has a 12-in. reinforced concrete base supporting the pumps and a 13-in. tile-brick wall faced outside with ½ in. of waterproofed plaster. A 12½-ft. headroom is provided in the lower story and 9 ft. in the upper room.

Above ground the circular wall is an 8-in. thick tile carrying a timber and composition roof. A timber spiral stair leads from the first floor to the basement. Sludge pumps have variable speed drives and automatic controls. They are each operated by a 5-hp. squirrelcage motor operating on 3-phase, 60-cycle, 220-v. current.

Digesters built above ground

Original designs for the two 60-ft. dia. digesters contemplated the use of unreinforced concrete to conserve critical reinforcing steel. Before their construction was started, however, the steel situation had eased to such a degree that they were redesigned and constructed as fully reinforced structures.

Economy of construction dictated that the digesters be built above ground to eliminate costly excavation due to high groundwater level. They are spaced 90 ft. c. to c. and are completely enclosed in a compacted earth fill extending up to the roof line. This fill has a 15-ft. minimum top berm and side slopes of 1 on 2. In designing the digesters a 650-psi. working stress was used for concrete; a 15,000-psi. stress was used for all reinforcing steel except the ring steel in the circular sidewalls which was designed for 30,000 psi. with full interior pressure from the enclosed sewage and neglecting any passive resistance from the compacted earth fill surrounding the structure.

An unreinforced concrete footing for the 21-ft. high sidewall sets 5 ft. above groundline on firmly compacted soil. The wall is 18 in. thick. A 12-in. concrete bottom slab slopes down 1 on 6 to a central sump which encloses an 8-in. cast iron pipe running to the sludge beds. The bottom of this sump is at the original groundline. The concrete dome of each digester is 6 in. thick, with an 8-ft. rise. It was poured with high early strength cement. This dome rests on the circular sidewall with no provision being made for continuity between dome and wall.

As a point of economy, and to conserve critical materials, no sludge col-

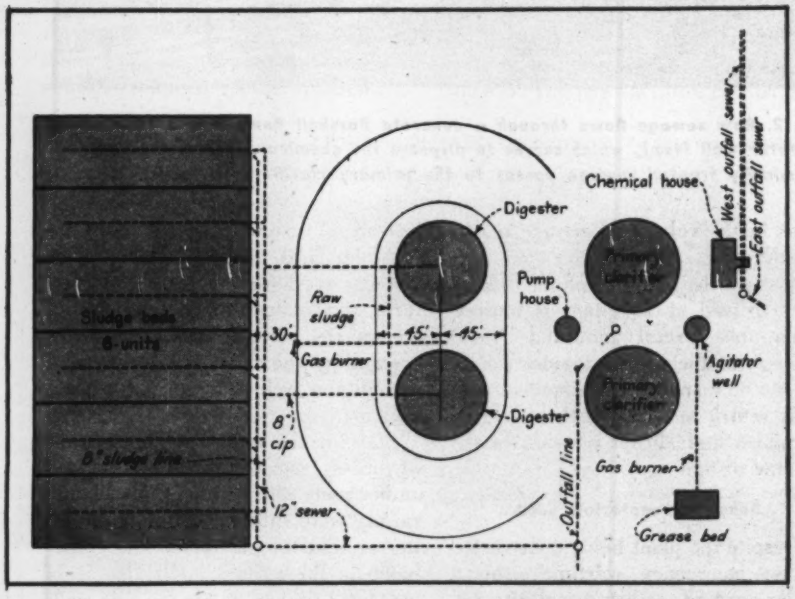


Fig. 3. General layout of the treatment plant and sludge-handling facilities.

tors were installed in the digesters. owever, to aid in flushing sludge to central sump, 8-in. dia. cast iron sleeves extending through the of are spaced 13 ft apart around the riphery of the dome for the inser- n of a flush pipe or hose. The bot- s of these sleeves extend 10-in. ow the level of the supernatent to vent the escape of sewage gas. ree banks of 8-in. cast iron sleeves the top of the wall draw off the ernatent and deliver it to an 8-in. where it returns by gravity to the stor well.

Mounted on the top of the digestor med-roof are a pressure relief and cuum breaker, and a flame arrestor. aste gas from the digester provides t for the chemical house and sludge mphouse. All excess gas is burned waste.

Six sludge beds

Six sludge drying beds are located ft. in front of the toe of slope of embankment surrounding the di- ters. Each bed measures 150 ft. by 50 ft. wide. Sludge from the esters flows by gravity through an cast iron pipe discharging onto mall concrete platform at one end ach bed. Manually operated valves mit independent operation of each

single line of open joint 8-in. r pipe extends down the center of bed. Twelve 20-ft. lines of 4-in. -jointed farm drains spaced 12 ft. t extend sidewise from the collec-

Fig. 4. Cast iron sleeves in the domed roof of the digesters admit flushing lines.

tor drain on a slope of 3 in. in 20 ft. The final effluent from the sludge beds is collected by these laterals, flows into the collector drain, through a 12-in. sewer line located between the sludge beds and digesters, on into the plant's 27-in. outfall and out into the South Canadian River.

The bottom of the sludge beds slope both inward to the 8-in. collector line and downward 2 in. in 6 ft. towards each lateral. Each bed is enclosed with two 3x12-in. treated timbers set 12 in. into the ground and supported by 4x4-in. treated timber posts, 5 ft. long and spaced 10 ft. apart.

After the sludge-bed area was cleared, compacted and shaped to the required contours, drain lines were installed and covered with about 10 in. of graded stone passing a $\frac{3}{4}$ to 2-in. screen. A 3-in. layer of $\frac{1}{4}$ to $\frac{3}{4}$-in. pea gravel was placed on top of the stone and covered with 9 in. of concrete sand.

Dried sludge from the disposal plant is furnished free for the taking, to farmers around Norman, and any not disposed of in this manner will be wasted on city-owned spoil areas nearby.

Contract cost for the sewage disposal plant, the 24-in. sewer intercepting the city's west outfall line, and the outfall sewer line from the plant to the river, together with necessary manholes and connections was $194,000. Funds for this work were provided by the city and the FWA.

Engineering personnel

All designs were prepared, and supervision of construction was furnished, by V. V. Long & Co., consulting engineers, Oklahoma City, under the direct supervision of V. V. Long and his associate, C. E. Bretz. R. J. Bates was resident engineer on construction. A contract for the sewage disposal plant and outfall sewers was held by the Ransdell Construction Co., Dallas, Tex. R. M. McCool is city manager of Norman and T. L. Morrow is plant operator.

Sanitary Engineers Trained in U.S.

ore than 300 sanitary engineers, icians and other public health ialists from the other Americas receiving or had completed ad- ed training in the United States e 12 months ended June, 1944, r the inter-American health and ation program, according to the ute of Inter-American Affairs. e professional men and women to the United States on travel or grants from the Institute, an cy of the Office of Inter-American irs.

e training of public health work- rom the other Americas consti- a phase of inter-American health , in which the United States is erating with 18 other American republics. The work, proposed at the Rio de Janeiro conference of American foreign ministers, is carried on by cooperative health services set up by each of the other American republics for the purpose.

The Coordinator's Office has assigned a United States health mission to each country to work with the cooperative service. Each mission generally consists of a physician, a sanitary engineer and a business manager. The chief of the mission in each country also acts as director of the cooperative health service, which in turn operates under the direction of the Minister of Health.

Thus the arrival of the professional men and women from the other Americas under the training program constitutes a two-way exchange of professional knowledge between the United States and her neighboring republics.

Through the cooperative health services in the other Americas, measures for disease prevention have been accelerated and expanded on a big scale. This work has been especially timely in meeting new and expanding needs for health services in the various countries. The cooperative health services have worked to control malaria around air and naval bases and in strategic centers of production and communication. They have built hospitals and health centers along the more important trade and travel routes. They have promoted industrial hygiene at mines, and have penetrated the sprawling Amazon jungles to serve the rubber tappers.

Improved Graphs for Sewer Calculations

V. Bogvad-Christensen,
Structural Engineer, San Francisco, Calif.

More rapid and accurate flow calculations for circular and egg-shaped sewers are possible by modification and improvement of the graphs commonly used. Two improved charts, one for each shape of sewer, are illustrated. It is believed that the charts are especially helpful when working with small flows.

The charts are based on Manning's formula:

$$Q = \frac{1.486}{n} a\, r^{2/3}\, s^{1/2}$$

where Q equals the flow in cu. ft. per sec., n the coefficient of roughness, a the cross section of flow in square feet, r the ratio of $\frac{\text{flow section}}{\text{wet perimeter}}$ or the hydraulic radius in feet, and s the slope. An accompanying table gives the values $\frac{1.486}{n}$ for various types of pipe for a number of conditions. The values of n are Horton's, obtained from p. 268 of the third edition of Handbook of Hydraulics by H. W. King.

The Manning's formula for most purposes may be written in the convenient form:

$$Q = 100\, a\, r^{2/3}\, s^{1/2}$$

This form has been used for the examples shown on accompanying charts. The curves represent the hydraulic data for minor flow expressed in fractions of the corresponding data for full flow. Since the sanitary flow represents only a small quantity as compared to the storm flow, it is obvious that an enlargement of that portion of the graphs for small flows was desirable.

For this reason, the two graphs were plotted in both directions to a scale equal to the square root of the figures (similar to the effect obtained by plotting on logarithmic paper). In order that the graph might be entered directly with the measured depth of the flow in feet, the relation between the depth of flow and the size of sewer was added at the left.

In each graph is a table giving the values of A, $R^{2/3}$ and $AR^{2/3}$ for different heights of commonly used sewer sections. In the tables A equals the total cross-sectional area and R

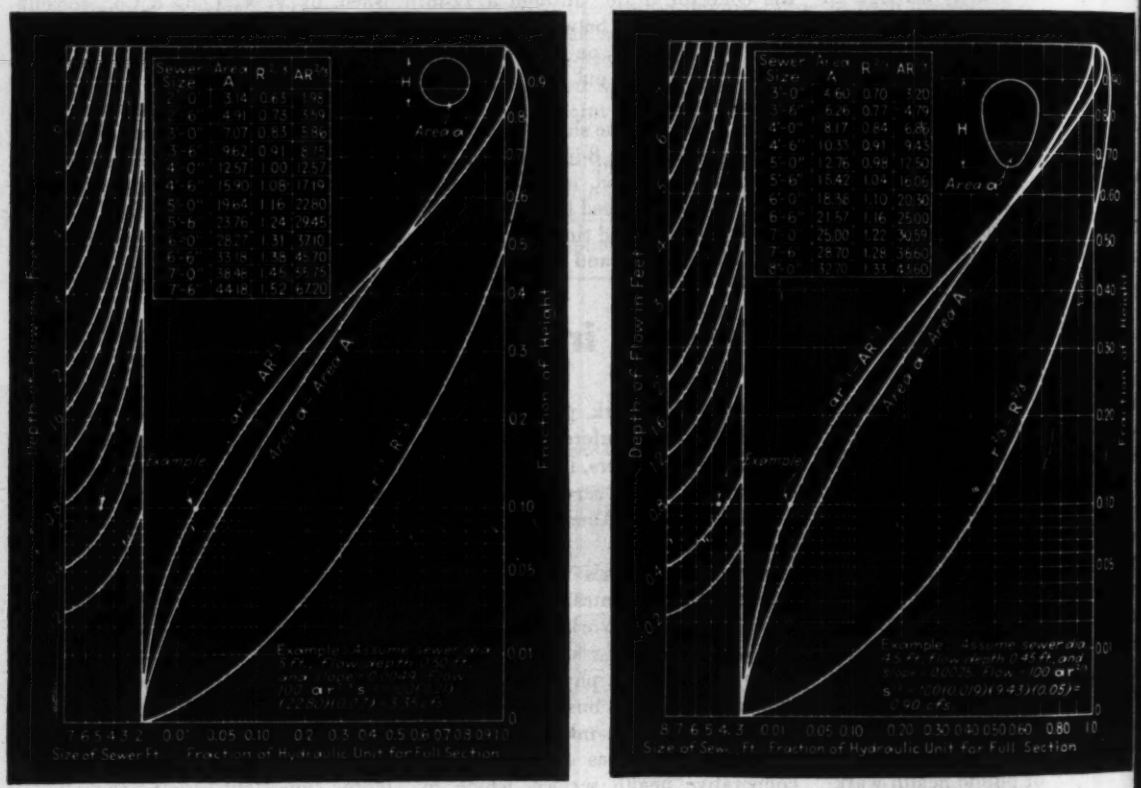


Fig. 1. Left: Design chart for circular sewer based on Manning's formula. Right: Design chart for standard egg-shaped sewers based on same formula. Height, and upper, intermediate and lower radii of egg-shaped sewer are, respectively, H, $\frac{H}{3}$, H and $\frac{H}{6}$.

hydraulic radius for the sewer ing full.

s an illustrative example for use e graph for circular sewers (Fig. assume the sewer diameter is 5 ft., h of flow 0.5 ft. and the slope 049. The discharge is found as fol-: Enter the graph at the left on vertical line for a 5-ft. sewer and e the point for 0.5-ft. flow by in-olation between 0.4-ft. and 0.8-ft. s (or by using the depth of flow essed as fraction of the height=). Proceed horizontally to the e $ar^{2/3} \div AR^{2/3}$, where the hori-al scale reads 0.021. Next from table at top of the graph obtain a 5-ft. sewer the value of $AR^{2/3}$, ch is 22.80. Now, since the square of $s = 0.0049$ is 0.07, two manip-ions of the slide rule solve the mula

$$Q = 100\ (0.21)\ (22.80)\ (0.07),$$

ing a flow equal to 3.35 cfs.

On the graph for egg-shaped sewers, which is used in the same way, an illustrative problem is solved. Together the two charts will permit rapid solution to a wide range of problems for both shapes of sewers.

TABLE I—VALUES OF $\frac{1.486}{n}$ FOR USE IN MANNING'S FORMULA:

$$Q = \frac{1.486}{n}\ ar^{\frac{2}{3}}\ s^{\frac{1}{2}}$$

Type of surface	Condition of sewer: Best	Good	Fair	Bad
Uncoated cast iron pipe.	123	114	106	99
Coated cast iron pipe...	135	123*	114	
Black wrought iron pipe	123	114	106	99
Galv. wrought iron pipe.	114	106	99	88
Smooth, brass and glass pipe.....	165	149	135	114
Smooth lockbar and welded "OD" pipe....	149	135*	114*	
Riveted and spiral steel pipe.....	114	99*	88*	
Vitrified sewer pipe.....	149	114*	99	
Common clay drainage tile.....	135	123*	106*	88
Glazed brickwork.....	135	123	114*	99
Brick in cement mortar; brick sewers.....	123	114	99*	88
Neat cement surfaces...	149	135	123	114
Cement mortar surfaces.	135	123	114*	99
Concrete pipe.....	123	114	99*	93
Wood stave pipe.....	149	135	123	114

*Values commonly used in design.

nitation Deficiencies in United States nalysed by Public Health Service

eficiencies in water supply, sew-disposal, and other sanitary fa-ies in many urban and rural areas ughout the United States now ace the health of millions and e huge economic losses each year, rding to the Sanitary Engineer-Division of the U. S. Public th Service.

his general conclusion was drawn a summary of four studies com-d to date in a national in-ory of needs for sanitation ities conducted by the Public th Service.

ew sanitation facilities which ld cost an estimated total of three a half billion dollars—but which ld largely pay for themselves in gs of health and economic loss e needed as quickly as supplies of r and materials and other practi-considerations, permit their con-ction, states the report.

he latest of the series of studies, inventory of rural sanitation ds, shows that more than 5,000,-rural homes now need new or roved water supplies, and that the e number of rural homes—includ-846,148 entirely without toilet facilities—need sanitary privies as a minimum.

It would cost about $265,000,000 to provide safe water supplies for rural homes, and about $180,000,000 to provide privies for the homes now without sanitary facilities and to replace half of the 8,505,572 existing outside toilets, about 50 percent of which are unsanitary.

Public water supplies

An inventory of public water supply facilities, another study in the series, indicated that new and extended public water supply systems costing $803,300,000, are needed to serve adequately the 86,300,000 people who now are served, or could be served, by public water supply facilities in the nation's communities with a population of 200 or more. This total includes $180,960,000 to construct 4,863 new water supply systems for 4,863 communities, $502,340,000 for extensions and improvements of existing systems in 6,455 communities, and $120,000,000 for softening of all water supplies needing such treatment but not now receiving it. (For further details of report see *ENR* Mar. 23, 1944, vol. p. 420).

The inventory estimates that the yearly economic loss now resulting from sanitary and other deficiencies in public water supplies totals at least $50,000,000. This includes an estimated $24,000,000 economic loss caused by water of excessive hardness, about $10,000,000 loss due to water-borne disease, including typhoid fever and diarrhea-enterities, and at least $10,000,000 loss due to miscellaneous other defects in the quality of water supplies.

Sewage disposal needs

An inventory of public sewage needs in various states indicated that there is need for $2,255,150,000 worth of new or additional sewers and sewage treatment systems for 13,915 out of 16,752 communities in the United States. This includes an estimated cost of about $1,200,000,000 for new sewer systems and extensions, and one billion dollars for facilities to treat sewage and industrial wastes. (*ENR* Aug 24, 1944, vol p. 238).

Public Health Service engineers estimate that the annual cost of water pollution is more than $100,000,000 a year, and that saving of this amount alone by pollution abatement would, over a period of years, very nearly pay for all the sewage treatment needs of every community of more than 200 inhabitants in the United States.

In another study, an inventory of milk pasteurization needs, it was indicated that 438 milk pasteurization plants which would cost an estimated $8,123,500, are required in 34 states and Alaska. The inventory showed that more than 97 percent of the milk supplies of communities in cities of 500,000 population or more is pasteurized, but that less than 25 percent is pasteurized in communities under 2,500 population.

[Editor's Note: It is of interest to compare the overall needs in water supply and sewage disposal facilities defined by the Public Health Service, with present progress in postwar planning to meet these needs. One such measure is provided by *Engineering News-Record* statistics of Sept. 14; these reveal that proposed construction of waterworks projects already totals $467,394,000 (the need is $803,300,000), and proposed sewerage construction now totals $822,530,000 (the need is $2,255,150,000).]

Solving a Sanitation Problem in Peru

Maj. Benjamin A. Whisler and Maj. Robert K. Horton

Division of Health and Sanitation
Office of the Coordinator of Inter-American Affairs
Washington, D. C.

***Editor's Note**—Providing water supply, sewage disposal, malaria control drainage and hospital facilities for Chimbote, Peru, a coastal town of 4,000 population, was the challenging task to which Majors Whisler and Horton of the Army Sanitary Corps were assigned early in 1943. Working virtually alone, they made maps of the area, designed structures and determined initial construction procedures for these facilities, not the least troublesome of which was the drainage of lagoons whose presence in this desert area is somewhat of a mystery. The project, which was undertaken by the U. S. Coordinator's Office in cooperation with the Peruvian government, forms part of an industrialization program that was described in Engineering News-Record Sept. 21, vol. p. 360.*

IN THE DEVELOPMENT of the Chimbote Bay region of Peru as an industrial center, a vital part of the program includes the installation of sanitation facilities of the town of Chimbote. This work, which involves the construction of malaria control drainage, water supply, sewerage and a 36-bed hospital, is being carried out by the Cooperative Inter-American Public Health Service (*Servicio Cooperativo de Salud Publica*). The latter is an agency of the Peruvian Ministry of Public Health, established by agreement between the governments of the United States and Peru.

In appraising the sanitation problem and its solution, the following background information is of interest. Chimbote, a town of about 4,000 persons is one of the few towns in Peru originating in modern times, having been laid out about 75 years ago by a North American engineer named Henry Meiggs. The layout, which is based on a rectangular pattern provides wide streets, the latter being in striking contrast to the narrow, crooked streets of most Peruvian coastal cities. The town is located but a few miles south of the mouth of the Santa River, the largest river in Peru

Peru-Service Aerofotografico Nacional photo

Fig. 1. Chimbote, Peru hugs the shoreline of a bay that is said to furnish the finest natural harbor on the west coast of South America. Although this is a desert region, freshwater lagoons served by underground streams are found on both sides of the town; the northern lagoons are shown in the foreground while another group are to be seen on the far side of the town near the bay. The Pan-American highway can be seen entering the town from the right-hand side.

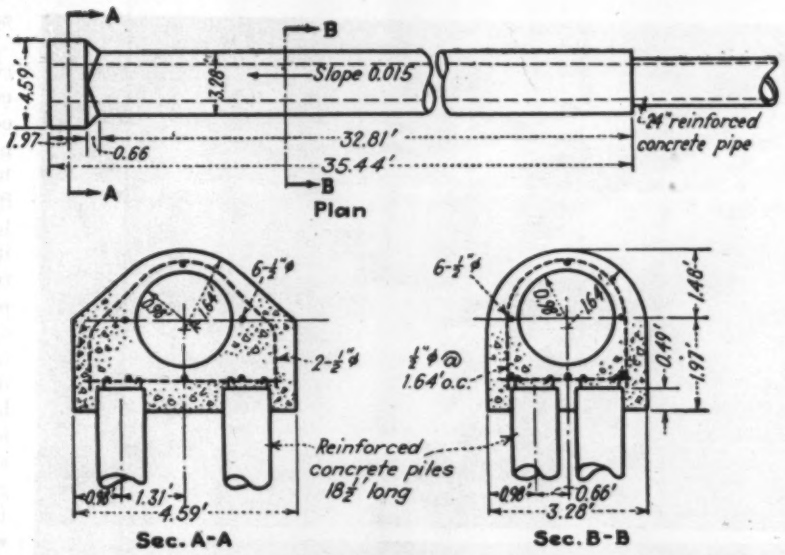


Fig. 2. Lagoon drainage outlet structure, which was built on the ocean shoreline. The concrete pipe, poured in place, is supported on reinforced concrete piles.

into the Pacific. While the part of the river valley is a rich, ated agricultural area, the plain Chimbote is the typical barren t of the Peruvian coast.

e present prominence of Chim- and the plans for its future de- ment are principally due to the or, the availability of coal, and velopment of waterpower on the . These factors, coupled with the ability of iron ore deposits near ast some 400 miles to the south, make possible the development of el plant in Chimbote, which d be a major factor in the future trialization of the Chimbote area.

Much evidence of malaria

e need for malaria control in the n was amply demonstrated when icroscopic examination of the d from a sample of school chil- in Chimbote indicated that 11 ent of those examined showed the ence of malaria parasites. En- d spleens were found in 24 per- of those examined. The vector in bote is *Anopheles pseudopucti- is*, which breeds in extensive la- close to town.

ese freshwater lagoons are of distinct types. One type, found of the town, is formed adjacent e beach by the wave action build- up the beach to dam the waste r and underground water ema- g from nearby irrigated areas. largest group of lagoons of the type is about 1¼ miles long and ages 0.3 miles wide and is located of the town and a half mile the ocean. Though the reason he existence of these lagoons is obvious, they appear to be the t of ancient man-made excava- installed for agricultural pur- , which are now partially sub- ed with respect to the ground- r table. There is a continuous of about 8¼ sec.-ft. from these ons. The water enters the lagoons any rather well defined under- nd locations along the eastern .

Mapping the lagoons

ecause of the very small difference evation between the ocean and the ons, it was necessary to make de- d surveys of the lagoons before design or construction of the nage system could be begun. orizontal control was established with the aid of transit-tape traverses, and the location of each station was computed using the coordinate system previously established by the Frederick Snare Corp. engaged in the construction of port works. Vertical control was established by numerous level circuits using the low-low tide datum established by the Snare Corp. The actual mapping was done by planetable. To conserve time and effort very little dry land topography was done, most of the work being confined to numerous shots on the shorelines and the bottoms of the lagoons.

Smaller individual surveys for the hospital site, reservoir, pumping station, sewers, etc. were tied to the same control systems. Much of the preliminary surveying was done with the aid of six students from the Escuela Nacional de Ingenieros during their summer vacation. Detailed maps were drawn for all the areas surveyed.

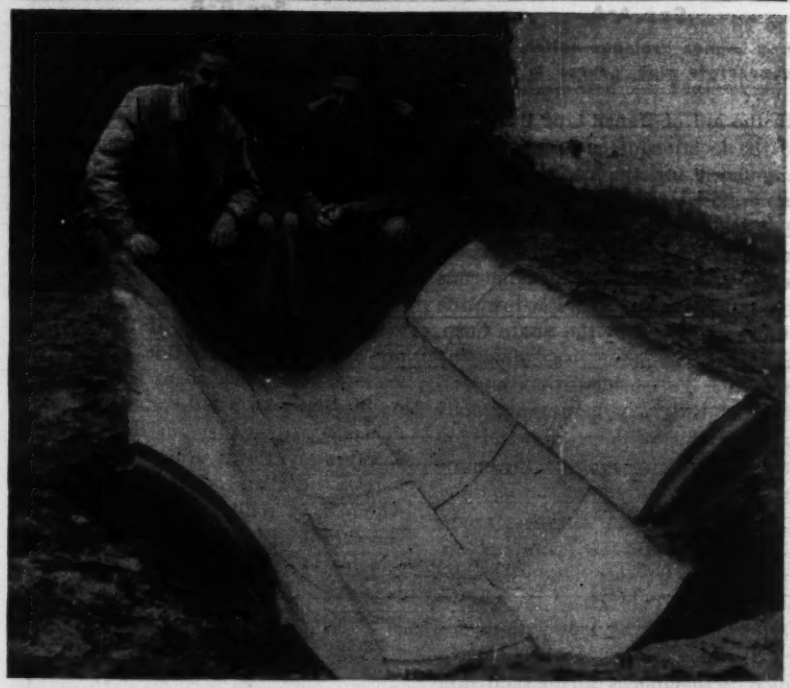
Malaria control by drainage

The permanent malaria control program consists exclusively of the drainage of the lagoons by means of channels lined with concrete slabs and provided with ocean outlet structures. However, the problem is quite different for the two types of lagoons.

With the eastern lagoons close to the beach, the principal difficulty is the construction of the outlets, sufficient grade for drainage being readily obtained. Each of these outlets consists of a very heavy 24-in. concrete pipe 32.8 ft. long poured in place and supported by twelve 10-in. square reinforced concrete piles designed to resist heavy wave action and undermining (Fig. 2). In back of the outlet is a precast 24-in. concrete pipe passing through the remainder of the beach, a distance of as much as 165 ft.

Because the inverts of the outlets are at or near mean tide level, it is necessary to sheet them completely. As no Peruvian wood commonly produced is satisfactory for driving, the sheeting used was American timber known in Peru as "Pino Oregon" which is usually Douglas fir. The sheeting used is a 3x8 in. planking in which a 1x2 in. tongue and groove has been set by hand. The sheeting is placed solely by loading with sandbags and jetting, using an ordinary 3-in. dewatering pump for supplying the jets.

A homemade drop hammer pile-driving rig is used for placing the piles. Much of the driving can be done without dropping the hammer, its weight and the weight of the pile being sufficient, with jetting, to bring them near final grade. In all cases, however, the pile is driven for the last few inches in order to consolidate the sand about the pile. After being brought to grade the concrete is broken away from the top of the pile to expose the hooks in the vertical reinforcing which is later tied into the reinforcing of the pipe barrel built on the pile. The pipe barrel is poured in two parts, the joint being on the hori-



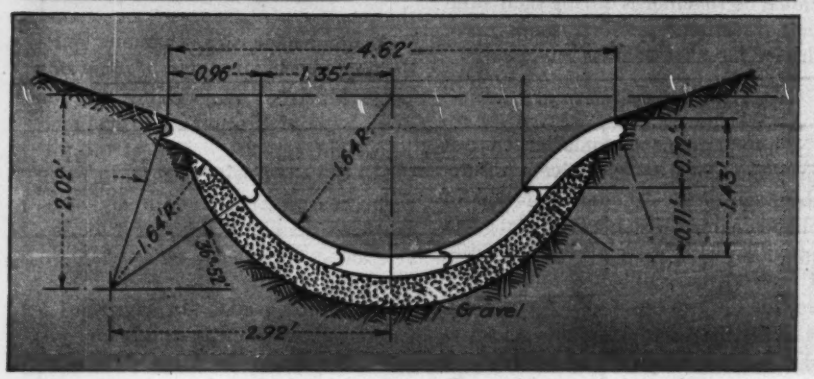


Fig. 3. Pre-cast concrete ditch liners were made at the site, using wooden forms (top) in which 5 slabs could be made at one time. The manner in which the liners are placed in a ditch is indicated in the center photo, which also shows the authors, Majors Horton and Whisler. The lower sketch gives the design details.

zontal axis of the pipe (See Fig. 2).

For the main north lagoons the construction of an outlet was not necessary for it was possible to use a concrete culvert over an existing channel at the beach for the outlet structure, the culvert floor being about 1 ft. below high tide. However, the problem of grades was very difficult and it was not known until completely detailed maps of the lagoons were complete whether or not they could be drained by gravity alone. At a distance of about 2 mi. from the outlet there are points on the bottom of the lagoons only 2.6 ft. above high tide level, or 4.9 ft. above mean tide level at the outlet. The final design gives a grade for the main channel of 0.00044 (for a velocity of 2 ft. per sec.) and will require a small amount of local filling at some points most distant from the outlet.

Drainage channels lined

All drainage channels are being lined in order to reduce the prolific growth of weeds and to prevent their filling with sand, as well as to facilitate cleaning of the ditches.

The lining consists of precast concrete slabs each 19.69 in. long, 13.78 in. wide, and 3.15 in. thick with tongues or grooves on all sides. These slabs are made in two forms, flat and curved. The standard cross-section consists of five curved slabs, three laid together on the arc of a circle to form the invert, and one laid on either side in an inverted position with respect to the other three to meet a 1 on 3 slope of the earth on each side of the channel (see Fig. 3). The cross-section of the main outlet channel for the north lagoons varies from the standard 5-slab section by the insertion of an additional flat slab on each side of the central curved slab of the invert.

The slabs are made in wooden forms designed to accommodate 5 slabs at one time. The forms are completely demountable, the side rails being held in place by wedges, and they can be taken apart or reassembled in a matter of seconds. It is expected that about 120,000 slabs will be needed for the complete job. A 1:2:3 concrete mix is used, with a water-cement ratio of 0.80.

Installation of the lining proceeds upgrade from the outlets. It is the practice to build a channel only so far as is necessary to lower the groundwater table sufficiently to dry up the

goons. Grades and locations have en established for about 5.7 mi. of h lined channel.

Temporary control operations

Since February 1943 a temporary squito control program has been rried out. Basically this has been a raying program using kerosene, but ne temporary drainage has been ne in order to reduce the area to be rayed. During the earlier months of is program as many as fourteen rayers were used, but as the pro- am became effective the number cessary has been reduced to seven. Regular and numerous larvae unts are taken in all areas and a riodic mosquito-trapping program s been followed in order to check e effectiveness of the work and to lp anticipate and prevent sudden reups in the numbers of Anopheles ospitoes in the area. The results of is control program have been very tifying, for now it is a rare thing find an anopheline at any of the mpling stations in town. This pro- am will be curtailed as the perma- nt drainage program becomes effec- e.

Water supply facilities

A start toward a water supply sys- n for Chimbote had been made a w years ago. The construction in- ded a distribution system of about 5 mi. of 4 and 8 in. cast iron pipe, adequately valved; about 6 mi. of ncrete pipe line (half of which was ry old pipe that failed frequently der pressure), and two sedimenta- n tanks and a pressure reservoir.

The source of the water was an irri- tion ditch over 12 mi. long originat- g at the Santa River. This ditch was t of service about ten days each ar for cleaning and at other times uld break, providing a very unre- ble supply. It was possible to aban- n the old source entirely when a ries of investigations showed that a table underground water could be tained about a mile from town. is source is the same water-bearing ratum which supplies the flow for e lagoons north of town.

The Frederick Snare Corp. used the l supply for construction purposes, t due to the defective main conduit is supply proved unreliable. Conse- ently, wher the Servicio developed a pply by means of test wells, the are Corp. installed a temporary

Fig. 4. Temporary mosquito control was secured by spraying the lagoons with kerosene.

pumping station and wooden storage tank to insure water for their work, taking the water from one of the Servicio's test wells. Water is now pumped to the town through the main 8 in. supply line, which is part of the permanent water system being constructed by the Servicio.

In the permanent installation the water will be obtained from an 8 in. well about 26 ft. deep. The well is being constructed by sinking a telescoping outer steel casing, 3.28 ft. in diameter at the bottom, through which the sand is being removed without dewatering the hole. A 6.5 ft. long bronze well-screen surmounted by an 8 in. pipe will be inserted in this hole. and the hole will be packed with graded gravel as the outer casing is removed section by section. This part of the procedure is particularly important for the well is being constructed in a formation that is practically all loose sand.

Adjacent to the well a pumping station is being built in which will be installed duplicate gasoline-engine driven, horizontal-shaft, centrifugal pumps with a capacity of 300 gal. per min. each. Provision is being made for chlorination of the water.

Water will be pumped through an 8 in. reinforced concrete pipe line to the city. This pipe is centrifugally cast by the Hume system, lined with a bituminous coating and tested at a pressure of 75 lb. per sq. in. The ends of the pipe are plain, the joint being made by means of a reinforced collar, which slips over the ends of adjacent sections of pipe; the joint is finished by grouting with cement mortar. A branch conduit runs to a reservoir on the hill in back of the town, which is located at an elevation to give 55 lb. per sq. in. static pressure in the system.

A feature of the reservoir is the provision for the structure itself to be

Fig. 5. Centrifugally cast reinforced concrete pipe, which was used for water distribution. This pipe is made in Lima, Peru, and is designed to carry a pressure of 75 lb. Grouted slip joints are used.

Fig. 6. Temporary pumphouse and elevated water tank built by the Frederick Snare Corp., which was utilizing the flow from an experimental well in foreground constructed by the Servicio.

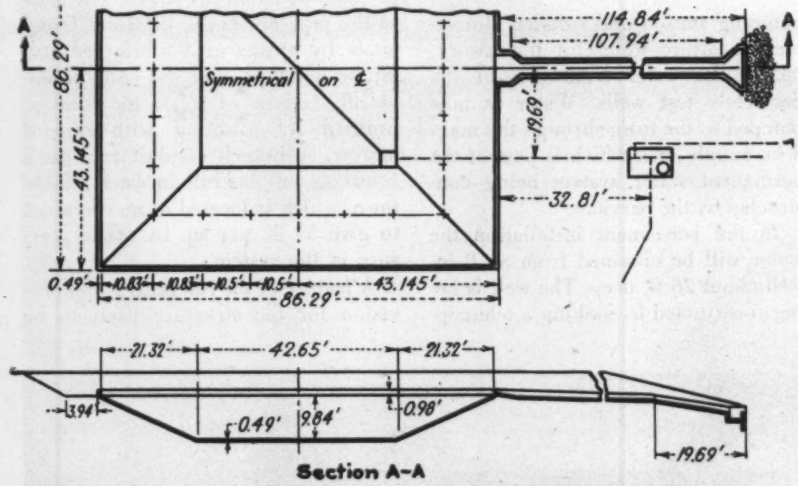


Fig. 7. Paved reservoir design details. This structure, which will be built on a sand hill, contains no steel reinforcement. It is provided with a long spillway and stilling basin to prevent washouts in case of overflow.

constructed entirely in loose sand. It is not being built as a reinforced structure, but as a paved excavation reservoir entirely below the natural ground level. A special requirement is a long spillway with a stilling basin in order to prevent destruction of the reservoir in case of overflow (Fig. 7).

The present distribution system is being augmented by nearly 2.5 mi. of new 4 in. cast-iron pipe, and is being thoroughly valved. No larger mains will be constructed until the need for them is apparent although the system has been designed to provide for future expansion.

A gravity sewer system is being installed to serve all built up and partially built up sections of the present city, with provision for indefinite extension to the north. Reasonable, though flat, grades have been obtained in the design. Some lines are laid at grades giving velocities less than two feet per second, but in all cases the grades are not flatter than those operating successfully in many parts of the United States.

For the most part the sewers are 8 in. in diameter. All the pipe is manufactured of unreinforced concrete by hand in Chimbote, dimensioned according to A.S.T.M. standards. Special forms of sheet steel were made for this job. Both the inside and outside forms are collapsible. A very dry concrete mix is hand-tamped in layers in the forms, after which the form is removed. Twenty-four hours later the pipe is placed in a tank for underwater curing.

A difficult construction problem is met in about half of the system, where the line is laid as much as 4.9 ft. below the groundwater table in loose sand. This requires the tight-sheeting of all this ditch and the use of concrete bedding about 3 in. thick under the pipe and extending another 3 in. up along the sides.

The 8 in. flexible joint, cast-iron sewer outlet is being laid under the ground to a point beyond the effect of any severe wave action. Beyond that point it will be laid on the bottom of the bay, protected by 6x6 in. piles on either side connected by 3x6 in. cross pieces, which will hold the pipe in place. The last 40 ft. of pipe is being laid horizontally, supported on similar piles, so the actual outlet is 328 ft. from the mean tide beach line, 3.3 ft. above the bottom and 13 ft. below mean tide level. If future developments indicate the need for an extension of the outfall this may be readily accomplished by adding to the flexible-joint cast-iron pipe.

Hospital service quarters

The main building of the hospital group is approximately 275 ft. by 39 ft. with three small wings. In it provision is made for 34 beds, a nursery, operating room, delivery room, kitchen, dining room, an out-patient clinic and waiting rooms. Another service building provides a laundry, shop, storeroom and two dormitory rooms with baths for eight employees.

The third large building provides living quarters for about 13 doctors and nurses. It consists of eight sleeping rooms, five bathrooms, and two living rooms. In addition a small boiler-house will be constructed for hotwater heating and to house the electric generating plant.

All these buildings are being constructed of concrete brick. This material was chosen as being most practical and economical because it would eliminate the need for plastering the exterior and some of the interior walls, and because a concrete brick-making machine was available on the

. The latter was a flat bed, ver- tamper, continuous production of machine.

The brick which are somewhat er than standard American brick, made from a mix that is hand- ed and shoveled into the hopper the machine. As the bricks leave machine they are loaded on indus- l cars and wheeled to storage piles re they were kept thoroughly wet two weeks. A total of 440,000 k was manufactured in about four a half months.

The one-story hospital and service ldings are designed to reflect the dern architectural style. The foot- and foundations are of concrete. e nearly flat roof will be of corru- ed asbestos-cement sheets, made in a, and will be supported on wood ers. The floors will be concrete, h most of them covered with asbes- tos tile, a few covered with concrete tile, and a few left uncovered.

Doors and windows have been manufactured in Lima of American plywood and Peruvian cedar. Hardware, plumbing fixtures and electrical equipment are of American manufacture.

A tunnel under the main corridor is used to carry the main plumbing lines and electrical conduits. Coupled with this is the use of hollow walls, consisting of two 4-in. walls with a space between, to house all the rough plumbing. A refrigerated storeroom opens off the kitchen.

The completion of the permanent malaria control project, the new water supply system, the sewer system, and the hospital buildings should assure the residents of the Chimbote area of healthful living conditions. This is a vital necessity if the port is to develop into the important industrial region that is anticipated.

The work in Chimbote has been carried out under the guidance of the writers acting as members of the health and sanitation field party of the Institute of Inter-American Affairs, of which Maj. E. A. Westphal, M. C. is chief of party in Peru.

The field party assigned to assist the Peruvian Servicio, is operating under the general direction of the Division of Health and Sanitation of the Basic Economy Department of the Office of the Coordinator of Inter-American Affairs. Maj. Gen. G. C. Dunham is assistant coordinator in charge of basic economy activities, Col. A. R. Dreisbach, M. C. is director of the health and sanitation division, and Lieut. Col. H. B. Gotaas, Sn.C. is assistant director and chief engineer of the undertaking.

Nazi Malaria Mosquito Campaign Halted By Airplane Dusting of DDT

itor's Note—A new weapon in the fight against the malaria mosquito, ose potentialities as an ally were enlisted by the Nazi in the marshes of ly, is the chemical powder, DDT. How this chemical was used to undo carefully planned campaign of the Germans is revealed for the first time a despatch to The New York Times, *by Anne O'Hare McCormick, which reprinted from the September 13 edition of the Times with permission. s. McCormick's story is one that will be of special interest to sanitary gineers in this country who are engaged in malaria control activities.*

ME, Sept. 11—The Italian cam- gn has been fought against three mies—the Germans, the terrain the mosquito. Yesterday this cor- pondent went down to the mouth of Tiber with Col. Paul Russell, chief the malaria control branch of the ed Control Commission, to see one the battlefields where the Germans sted the mosquito as an ally in r bitter fight against the Allied ies and the Italian people. That were out to punish both is evi- t in the furious demolition along beaches of Ostia and the scientific wherein they smashed drainage ps and blocked canals to flood the o Romano, the fertile plain be- n Rome and the sea that until years ago was a malarial swamp deadly as the Pontine Marshes.

Apparently the Germans expected an Allied landing at Lido di Roma. They prepared for it in three ways; first they put up an almost solid wall of concrete blocks for miles along the coast and behind that a vast minefield. And behind that they created a breeding place for the Anopheles mosquito, extending to the outskirts of Rome.

Toll of malaria

In some regions of Italy, as in the Pacific islands, the Balkans, the Near East and probably now in flooded areas of Holland, malaria is the greatest disease hazard of our armies, often more dangerous than the enemy. In the last war the Germans referred to Macedonia as the greatest of all concentration camps because malaria there immobilized French, British and American troops. At one time 43 percent of General Allenby's army was out of the firing line because of this debilitating fever. This experience prompted army chiefs to establish special units to fight malaria in this war, with the result, according to experts here, that less than 2 percent of the army has contracted the disease. In Italy the army branch works to control malaria within military cantonments, and the ACC branch is surrounding areas for further protection of Allied forces. Under direction of Colonel Russell, who came here from the Surgeon General's office after long experience with the Rockefeller Foundation in India and the Philippines, are a civilian control unit consisting of four army officers, two Italian consultants and a demonstration unit including three staff members of the Rockefeller Foundation loaned to the Army, one Army officer and five Italian malariologists. The special function of the latter unit is to develop a practical method of using a new powerful insecticide called DDT in malarial districts.

Yesterday we made a trip to see Agro Romano dusted with DDT from an airplane piloted by a Georgian who had learned how by spraying cotton fields of the South against the boll weevil. An accident prevented the plane from turning up but the effects of nine previous weekly sprayings convinced officers that this new chemical

(dichloro-diphonyl-trichlorothane) is one of the greatest discoveries of modern times.

It was an exciting experience to stand on the coast of ancient Latium, chief base of Roman seapower in the Punic Wars, and observe the results of the experiment with this wonder-working chemical, first synthesized by a German named Zeidler in Strasbourg in 1874, discovered to have insecticidal properties by a Swiss chemical firm in 1939, but developed for practical use by the United States Department of Agriculture in cooperation with other wartime research bodies in the United States and Great Britain. DDT now is used in practical service among Allied forces in every fighting zone. It was never employed in quantity until last July, and for the first time in large-scale experiments in malaria control in this theater. The Germans reduced the Agro Romano to the mosquito-breeding swamp it was for centuries before drainage work began in 1887. They knew exactly what they were doing, for in a farmyard we visited the walls of two pigsties occupied by Nazi soldiers were decorated with clever sketches of the plague of mosquitos that would follow the flooding of the farmlands. They have been foiled so far as the Allied Army is concerned by preventive measures taken in every camp by malaria control units, and while the malaria mortality rate among Italian civilians, reduced from 324 per million in 1918 to an all-time low of 14 in 1939, is expected to rise to the 1918 level this year, except in Littorio Province it will show improvement over 1943.

Widespread benefits

In Agro Romano, thanks to the fact that pumps operated by Diesel engines are easier to repair than the electric pumps destroyed in the Pontine Marshes, the land is almost dry again, and DDT is thought to have killed not only larvae but mosquitos in farm buildings. This district at least will be under cultivation again next year. Air photos show that the Po delta has also been flooded, and the ACC is prepared to deal with that situation as soon as the Germans are driven out. What is happening is that the health commission of the ACC, though limited by its charter to maintaining health, order and peace behind the lines for the protection of the armed forces, in executing its task is actually performing a great work of rehabilitation for the country. It cannot save the Army from malarial infection without helping to redrain German-flooded areas, thereby starting the fundamental work of reconstruction.

Malaria Epidemic Danger Is Remote

There is little danger of any serious epidemic of malaria in the continental United States traceable to soldiers returned from malarious battlefronts, in the opinion of Maj. O. R. McCoy, chief of the tropical disease control division in the Preventive Medicine Service of the Office of The Surgeon General of the Army.

Among soldiers, it was reported recently, the malaria situation has improved to a point where the effectiveness of combat units is no longer seriously threatened so long as "atabrine discipline" is properly maintained. Nevertheless, some civilian authorities have indicated their fear that the return of malaria victims to the homeland might cause new epidemics or re-establish the disease endemically in areas which have not known it for several generations.

Control work important

Such fears are unwarranted, Major McCoy says. He pointed out that there is no reason to presume that mosquito control work, on which our principal dependence has been placed for malaria control, will not continue to operate effectively despite the presence of returned soldier victims.

"Malaria has always been present in the United States," he said, "especially in the southeast, but, with a few exceptions, established measures have proved adequate in protecting non-endemic areas. Malaria appears occasionally in northern states. Last year there was an outbreak in Illinois and less recently cases in Iowa, Minnesota, New Jersey and Ohio.

Another fear of the American public: that malaria, once acquired, lasts for life, is unfounded points out the Office of The Surgeon General. Vivax malaria, which is the most common type, very rarely persists for more than one to two years, and three years is the maximum time, when the disease is propely treated. There also is no evidence to support the fear that the disease leaves any permanent damage in its victims. Named after the species of malaria parasite which causes the benign tertian form of the disease, vivax malaria rarely causes death. Its attacks of chills and fever occur every other day.

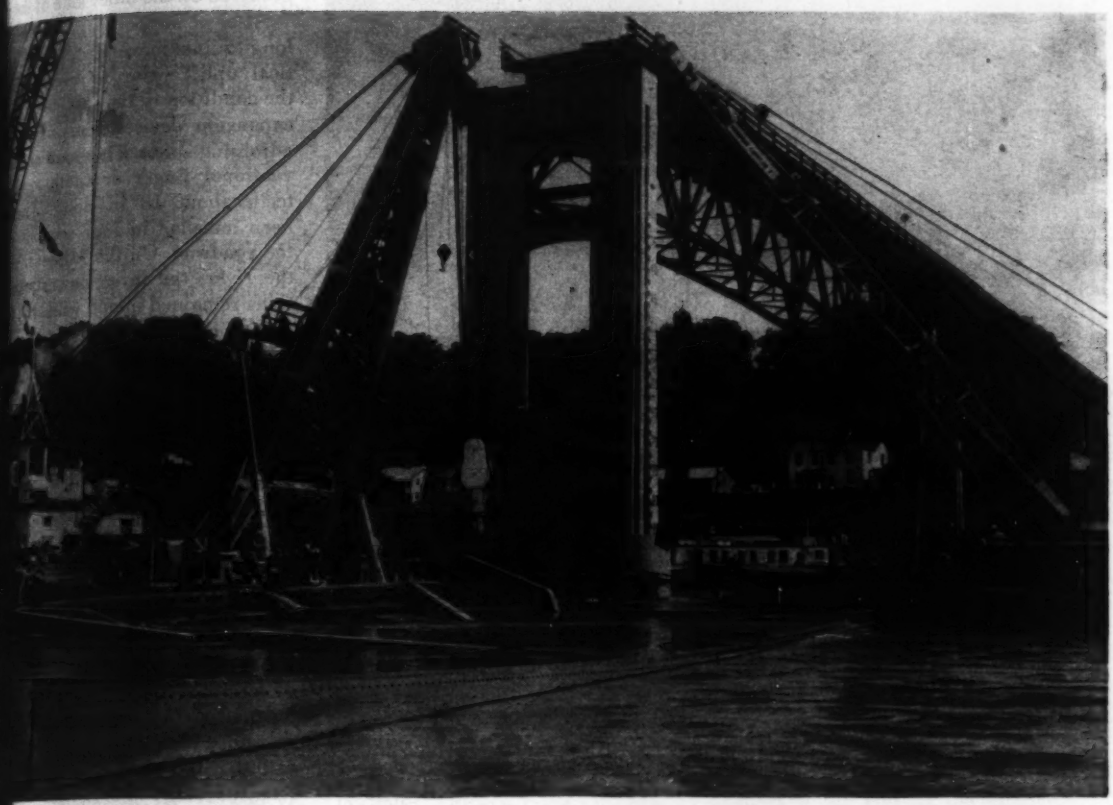
The malignant form of the disease is known as falciparum malaria. Atabrine, a synthetic substitute for quinine, has been found to be a cure for a high percentage of the cases of this form of malaria.

Malaria is still, as it has been for some 2,500 years, "the most important disease in the world," its students believe. References to it in classical literature indicate that it was probably responsible for the deterioration of human resources that produced the collapse of the ancient Greek civilization when it was introduced into Greece when Athens was at its cultural and economic peak in the fifth century B.C., and today it is responsible for some 3,000,000 deaths among 300,000,000 victims a year. Most of it occurs in areas where American soldiers are now fighting—the Mediterranean, India, Burma, China, the Dutch East Indies and nearby islands in the Pacific.

Atabrine is effective

Japan seizure of cinchona plantations in the Dutch East Indies, the world's principal source of supply for quinine, was a handicap to control measures for a while, and early in the war combat troops sometimes suffered severe loss of effectiveness due to malaria. There have, however, been few deaths.

But in the meantime, atabrine has been developed. It originally was regarded more or less as a quinine substitute, but as Army medical men learned to use it and research delineated more clearly its usefulness, it came to be recognized as even better than quinine, for it will cure specifically the malignant falciparum malaria and is just as effective and less toxic than quinine in the treatment of vivax malaria, the more common form.



Heavy hoisting equipment removes torn and twisted bridge trusses from the muddy Mississippi at Chester, Ill.

Removing a Bridge From the Mississippi

***teats in Brief**—Heavy marine blasting removes 500 tons of the wreck-al the Mississippi River bridge at Chester, Ill., to provide a 300-ft. navigation channel. Salvage operations completed in 15 days and ut mishap, despite unusual hazards. Reason for failure of bridge in wind still unexplained.*

OM does a bridge constructor a large river bridge, then turn d and remove part of it from the ed within a period of two years. his is what happened at Chester, when the same contractor who a bridge over the Mississippi there in 1942 recently removed of the two 670-ft. continuous spans which toppled into the during a windstorm of tornadic ity on July 29.

owners of the bridge, the Chester idge Commission had the first sibility for removing the col- truss spans. But as guardians of continuous and uninterrupted flow of river traffic the Corps of Engineers, U. S. Army, had the task of expediting the removal of a sufficient length of bridge to restore full use of the navigation channel. Accordingly these two agencies met and agreed that the Army Engineers would remove 300 ft. of bridge on the Illinois side of the river. Despite the fact that the job promised to be dangerous, difficult and expensive (steel that cost 9½ cents per lb. erected cost 5 cents per lb. to remove), speed was imperative.

Barge tows could use a channel 150 ft. wide and 9 ft. or more in depth between the Illinois bank of the river and the pier which had supported the east end of the continuous trusses, but there was always the danger that it might be blocked. A salvaging contract, therefore, was negotiated, equipment was mobilized and removal operations of the part of the steel in the main channel were started Aug. 13. Work continued 12 hours a day (night operations being considered too hazardous), and fifteen days later the 300 ft. of bridge, containing some 500 tons of steel, was completely removed and piled on the Illinois shore a short distance below the site.

Manner of failure still obscure

It had been hoped that closer examination of the wreckage, which salvaging afforded, might throw new light on the manner of the failure (*ENR*, Aug. 10, 1944, p. 138), but

After a twisted mass of dynamited steel was raised above the river, members were burned into convenient lengths for loading onto barges.

only a few new facts resulted. Examination shows that the trusses made a one-quarter revolution as they fell on the downstream side of the piers. They came to rest with the downstream trusses on the river bottom and the upstream trusses more or less directly above, parts near the center of the Illinois span being out of the water. Very little of the 4½-in. concrete-filled floor grating was found. It had been lightly welded to the stringers and thus could have broken free and settled to the bottom of the river.

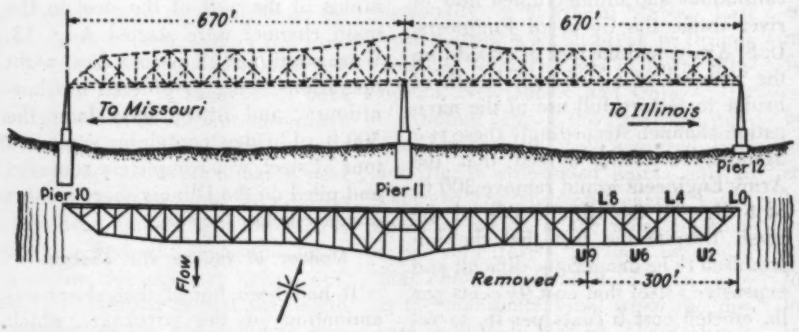
The theory has been advanced that there was a combination of longitudinal movement and uplift, together with the overturning of the two spans. The condition of the sleeve connections, through which the handrails on the approach and on the collapsed trusses were joined, points to a longitudinal movement; although the sleeves were virtually box sections, the truss handrails on the Illinois side of the river pulled out without bending or damaging either the sleeves or the adjacent railing members. It was reported that a similar pull-out action occurred on the other side of the r

Also in support of the theor longitudinal movement, as well as tical uplift prior to overturnin the condition of the cast steel roa expansion devices remaining on adjoining spans. These are of the ventional finger or tooth type, teeth about 18 in. long. They been installed in four sections a the roadway. On the Missouri si the river, the three downstream tions remained intact, while the f section was torn off as the s turned over. At the river pier o Illinois side, the downstream se of expansion guard remained in p although it is bent slightly up The other three sections tore shearing the ¾-in. bolts that ha chored them to the approach roa slab.

While the condition of the a ing handrails and roadway expa devices suggest that some longitu movement occurred at each end o two-span continuous truss at the of failure, both movements coul have occurred simultaneously. thermore there is no evidence to cate that the truss, as a whole, m longitudinally. It has been sugg that one end of the span could pulled away from its connecting followed by a similar movement other end.

Other facts developed by rece amination show that virtually no age occurred to the top of the pier on the Illinois side, whil west pier showed small amou spalling and abrasion. Conside spalling occurred at the center the largest of which was a p roughly 12 in. across and 6 in. probably gouged out when th stream top section of the fixed sh it with terrific force. The lowe tions of the center pier shoes place and practically undamaged upstream pin lies on top of the and shows signs of the Lomas having been stripped off. As t rocker bearings at the expansi outer ends of the spans, three of went with the trusses. The one downstream end of the east pie lies on the bearing plates, alt skewed about 45 deg. out of po in being wrenched from the sole on the bottom chord of the tru 16 connecting bolts were snapp clean.

Most of these facts, it will be



Salvage operations started at L0 and continued toward the center of span to provide a clear navigation channel.

e to evidence visible above the r. Actually, the principal new in-ation supplied from the salvag-is that the bridge floor broke away the rest of the structure

Salvage equipment

would be expected, heavy equip-t was needed to dislodge the tan-mass of steel from the riverbed bring it to the surface, after it been dynamited into removable ons. To insure ample lifting equip-t and to expedite the work, the ement with the contractor called e U. S. Engineers to furnish their ton derrick boat, the "Hercules," ther with its 5-man crew.

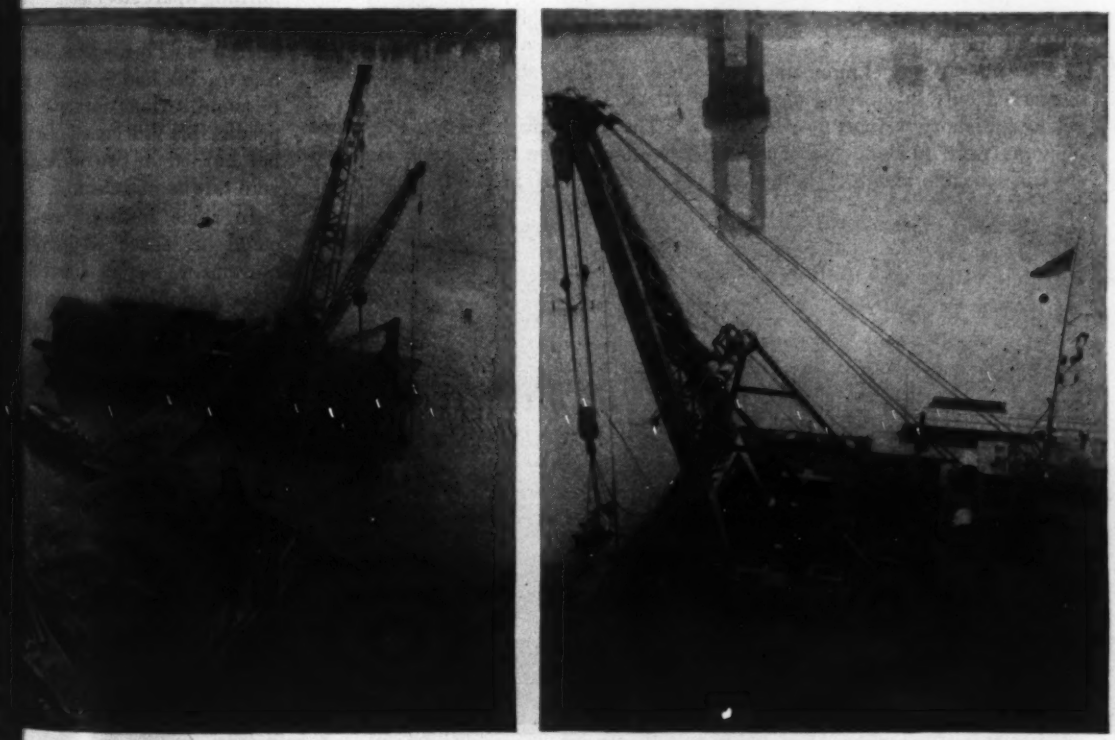
e Hercules, whose keel was laid 940, has an 85-ft. boom mounted a 40x112x8-ft. all-welded steel e. The boom carries a 16-ton r block and an 8-ton upper block d with 1,640 ft. of 1¼-in. steel rope forming a 16-part line. n power is supplied under auto-control and at 125 psi. pressure. e contractor's main equipment ded a 25-ton completely revolv-derrick, with an 85-ft. boom, nted on two 26x110x6½ ft. all-d steel barges; a 1½ cu. yd. er crane with a 65-ft. boom hav-ing a lifting capacity of 12 tons and securely lashed on the deck of a 26x110x6½ ft. steel barge; and a 50-ton capacity A-frame carrying a 13-part line block and falls operated by a steam hoisting engine and mounted on a steel barge. Both the Hercules and the A-frame lifting barge were well ballasted with water in their rear compartments.

Other equipment on the job included a twin compressor to furnish air to the divers, a 2-way communications line from diver to tender, six 15x40x4-ft. all-welded steel ponton "work flats" and a 250-hp. diesel tow boat for towing salvaged steel to the river bank.

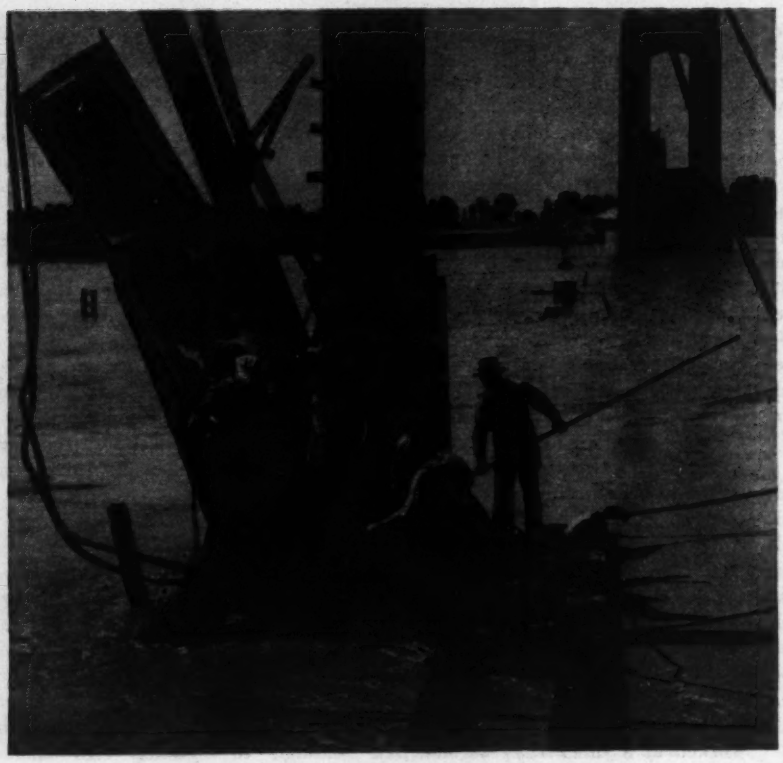
To handle all of this equipment, the contractor used the following crew: 2 construction superintendents, 1 chief engineer, 2 iron-worker foremen, 10 iron workers, 4 power equipment operators, 3 boat operators, 2 deck hands, 3 oilers and firemen, 2 divers, 2 diver-attendants, 1 powder "monkey" and 4 laborers. Although 2 divers were constantly on the job, only one worked at a time. They carried 212 lb. of equipment and leadweights to help steady themselves in the river current.

First operation in removing steel was to anchor the Hercules immediately upstream from the second panel point (L2) of the bottom chord. The 25-ton derrick was anchored in a similar position on the downstream side of the hip joint (U2) of the top chord. With the barges in these positions, a lift was made at L2 and U2, with the hope that the end of one or both trusses could be raised above the water sufficiently to permit burning into sections convenient for removal. But this plan failed. So great was the weight of end rockers and the steel members, framework and floor system in the two 33½-ft. end panels that the truss span bent sharply at the pickup points and no steel could be raised clear of the water.

Slings were released, the trusses settled back into position and the two end panels of the upstream truss were blasted off under water at the original pickup points. While this work was going on, the two other derricks removed all steel visible above water, or any that could be lifted sufficiently to permit burning into lengths short enough to handle. This included mainly the upstream truss between panel point 6 and panel point 9, which marked the end of the salvage contract. The next operation was to re-



ed steel was loaded on barges by a revolving crane and a crawler crane (left) while the U. S. Army Engineer der-oat (right) moved out over the bottom truss chords to do the heavy lifting.



Some idea of the hazards of the work is shown in this action picture of workmen attaching slings preparatory to burning sections for removal.

move all of the upstream truss and as much of the cross-bracing and floor system as possible between panel points 2 and 6.

Since the Army Engineers were concerned only in clearing the channel in the shortest time possible, no attempts were made to salvage any steel in reusable lengths. There were, however, several sections of cords and web members removed in straight lengths up to 30 ft. Whether such members have a salvage value for reuse in other structures is problematical.

The really tough job was to remove the downstream truss, some of which was embedded in sand, particularly

One of the first salvage operations was to cut and remove all steel projecting above the river.

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The 25-ton derrick barge f
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No burning under wat

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ting torches had to exercise g
to avoid serious injury from
predictable movement of a ste
ber burned in two while und
vere torque or strain.

In some instances such
could be lashed securely to
movement. But in others the
from a snubbing line or cab
ing did not permit of their
these instances the torch oper
careful to stand clear of th
pated movement of the memb
cut. Even then he was always
to a safety line running to
barge in the event the spring
steel truss member toppled
the water. So carefully was
ting of steel planned and
that no such accidents occur

Blasted under water at

After a few trial blastin
made at the start of salvag
tions, it was found best to
trusses at their panel points.
eral procedure was to send

…n to place dynamite charges on …h chord member, vertical and diag…l meeting at the joint.

In general, it was not necessary to …st the floorbeams loose and usually …was possible to lift them out while …ched to the joint of the truss. …metimes this took considerable …cking and pulling to break the …ts in the connections at one end …the beam.

In the early stages of the job the …ngers were not cut loose from …rbeams until they had been hoisted …ve water. Later, however, it was …nd the removal operations could …expedited considerably by blasting …nger connections free.

Seldom were the dynamited breaks …n at any joint, but the heavy dyna…e charges demolished it sufficiently …permit the tangled steel to be …sted above water where the differ… members could be burned off and …ded onto the barges.

Placing the heavy dynamite charges …er water was a dangerous and …lish job. Although the river cur… did not exceed 5 ft. per sec. it set …heavy vibrations in the steel and …dynamite charges had to be placed …otal darkness due to the turbidity …he water.

High-velocity gelatin dynamite

…n blasting the main members apart …amite charges made up into cart…ges 5 in. in dia. and 16 in. long …containing 80 percent high-veloc…gelatin dynamite were placed di…ly against the members and just …ide of the gusset plates.

…ve dynamite charges were needed …ear the heavy top chord sections …rt, the heaviest of which was made …f a 28x1$\frac{1}{16}$-in. top coverplate, two …$\frac{7}{16}$-in. side plates and four 6x4x$\frac{5}{8}$-…ngles. Three charges of dynamite …e placed inside of the chord sec…—one against the top coverplate …two against the side plate and …es lying on the riverbed. The …r two charges were placed on top …e other side plate and angles.

…e bottom chord was open, laced …oth flanges, and its heaviest sec… was made up of four 7x4x$\frac{1}{2}$-in. …s, two 12x$\frac{1}{2}$-in. and two 26x1-in. …plates. Only four of the 5-in. dia., …. long, 80 percent high-velocity …ine dynamite charges were re…d to blast the bottom chords in …Two of the charges were placed …een the chord members and on top of the one lying on the riverbed, and the other two were placed on top of the other side plates and angles. Dynamite charges were held in position with sandbags.

As wrecked steel is loaded on barge (lower right) examination of pier top shows handrail expansion sleeves were not damaged, while some of the roadway expansion device is intact. Also, through the shearing of 16 bolts connecting it to the bottom chord, one expansion rocker remained on top.

Only one dynamite cartridge of the same size as those used on chord members was necessary to demolish the verticals and web members which usually were two channels, laced. A 60 percent high-velocity gelatine dynamite was used to blast these sections apart, the heaviest of which were 18-in. channels weighing 42.7 lb. per ft. The dynamite charge was placed between the two channels and held in place with a sandbag. A similar blasting charge was used on the stringers and other cord members made up of plates and angles.

All chord members were silicon steel. Web members, stringers and floorbeams were carbon steel.

At some of the panel points 5 members were torn apart at the same time, using 13 dynamite charges. All were fired simultaneously with a "primer cord" fuse, which in turn was fired with an ordinary electric blasting cap connected to a long insulated duplex cord running to a hand-operated blasting machine.

Attaching the 1$\frac{3}{4}$-in. steel wire rope sling from the hoisting cable around sections of steel to be removed from the murky river was a tedious and

A close-up of a truss joint shows the effect of marine dynamiting.

laborious job. Working in total darkness, usually using one hand, the diver would guide the sling down on one side of the steel to be removed. With the sling hanging vertically beside the steel to be removed, a ¾-in. rope was passed under the steel and up to a barge located on the other side of the member. A firm pull on the rope bent the sling under the steel and up on the other side of the piece.

The rope was then passed over the steel to a barge located on the other side of the member, and pulled tight to completely encircle the piece of steel. With the loop thus completed a shackle attached to the free end of the sling was threaded around the lifting cable and closed with a large cotter key which was locked with a bolt that operated as a cotter pin.

Removal of the remainder of the 670-ft. span on the Illinois side of the river will be executed by the St. Louis Engineer District, U. S. Army. Negotiations are under way and salvage operations will be resumed soon. This will restore the full use of one clear span for navigation. Removal of the other span can then be accomplished by the Chester Toll Bridge Commission whenever it is able to secure the necessary funds.

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Massive size combined with strength has been achieved in the huge spud of laminated wood manufactured for a dredge used on the Columbia River by the General Construction Co. of Seattle. The spud is 85 ft. long, 30x30 in. in cross section and weighs, dressed to net size, about 19,200 lb.

In fabrication, 10,345 fbm. of kiln dried lumber and 320 lb. of urea cold-setting resin glue were used. The laminations are 2-in. rough stock dressed to 1⅝ in. net, of random width.

The pieces in the spud were laid out one lamination at a time and one upon the other. All edges were coated with fresh glue. Pressure was applied by means of clamps both vertically and horizontally, and was retained until sufficient time had elapsed for the glue to set properly. No nails were used in the timber.

At one end the timber was rounded off by hand tools to fit it inside a steel spud point necessary to protect the bottom end of the stick in contact with the river bottom. A long vertical groove, starting at the top of the timber and running down one side about 36 ft. was tooled to the proper width and depth to take a heavy railroad rail that was used as a sliding guide for the timber while in use on the dredge.

When the clamps that held the timber as it was being laid up were removed, the timber was moved to the yard by means of two lumber carriers, one near each end. It was placed on a truck and trailer with two lumber stackers and then hauled to the water front.

The truck was backed down to the water's edge and bindings were cut loose, allowing the timber to slide down the rollers on the truck into the river, where it was towed to the site of the dredge. It was placed in the spud channel of the dredge by means of a block and tackle applied at one end, which raised it directly out of the water and stood it on end in its channel.

Timber Structures, Inc., Portland, Ore., was the fabricator.

This 19,200-lb., 85-ft. long timber spud fabricated for use on a Columbia River dredge was transported overland by truck.

From Field and Office

ORKING PROBLEMS AND TIME-SAVING METHODS FOR ENGINEERS AND CONTRACTORS

Rapid Method for Dividing A Circle Into Equal Parts

A simple, approximate, but accur- e, method of dividing a circle into equal number of parts is illustrated the accompanying drawing. The cedure is rapid and especially luable for draftsmen with a limited thematical background.

In constructing the drawing the ameter LS is spaced into n parts (in illustration $n = 5$). The point H located by describing an equilateral angle on LS, making the lines LH d SH equal to LS and thus equal to The line HPM is drawn through the cond division P; then LM is the de- ed nth part of the whole circle.

To prove that LM in the general e is an approximation, its true ue is computed. To do this draw N, OM and MN. Then $OMN =$ $M =$ angle θ, which is the angle be computed.

$MN = OM\cos\theta$ and $ON = OM\sin\theta$

$$LP = 2\frac{LS}{n} = 2\frac{d}{n}$$

$$OP = \frac{d}{2} - 2\frac{d}{n} = \frac{d}{2}\left(1 - \frac{4}{n}\right)$$

$$HO = \frac{d}{2}\sqrt{3}$$

om the similar triangles MNH and H,

$$\frac{MN}{PO} = \frac{ON + HO}{HO}$$

hen the values are substituted, this ression becomes the quadratic uation:

$$\theta\left(3+\left(1-\frac{4}{n}\right)^2\right)+2\sin\theta\left(1-\frac{4}{n}\right)^2\sqrt{3}$$

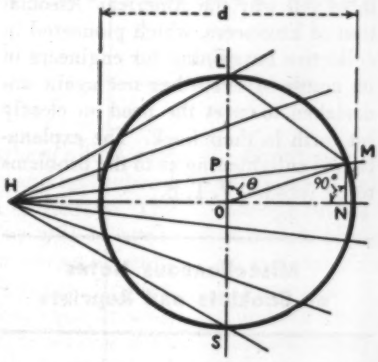
$$-3\left(1-\frac{4}{n}\right)^2, \text{ giving the desired angle}$$

$$\theta = \frac{\sqrt{9-6\left(1-\frac{4}{n}\right)^2-\left(1-\frac{4}{n}\right)^2\sqrt{3}}}{3+\left(1-\frac{4}{n}\right)^2}$$

esting this equation for various ues of n we get:

$n=2$,	$\sin\theta=0$	$\theta = 180$ deg. (exact)
$n=3$,	$\sin\theta=\frac{1}{2}\sqrt{3}$	$\theta = 120$ deg. (exact)
$n=4$,	$\sin\theta=1$	$\theta = 90$ deg. (exact)
$n=5$,		$\theta = 71$ deg. 57 min. 20 sec.

latter value for angle θ is 2 min.



40 sec. too small, for $\frac{360}{5} = 72$ deg. The error is $\left(\frac{1}{8{,}100}\right)^{\text{th}}$ of the whole circle and is negligible for graphical purposes.

For $n=6$, $\sin\theta=\frac{1}{2}\sqrt{3}$ $\theta = 60$ deg. (exact)
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The last value for angle θ is not exact, because $360/7 = 51$ deg. 25 min. 43 sec.

For $n = 360 \sin\theta = 1$ deg. 51 min. 48 sec. but 360 deg./360 = 1 deg.

G. MIANULLI,
Brooklyn, N. Y.

Field and Office Comment

Slide Rule Method Does Not Save Time

Sir: The article by J. J. Del Bourgo in the Field and Office pages of the June 29 issue of *Engineering News-Record* is interesting, but far from accurate. It does not appear to be an error in typesetting or proofreading.

The figures in question come from solving the quadratic equation $X^2 - 349X - 7{,}432 = 0$. It is known that the sum of the roots should be equal to +349, and the product equal to −7432. The roots offered by Mr. Del Bourgo are +369.7 and −20.7, the sum of which is 349, but the product of which is 7,652.79.

If whole number accuracy is all that is required, the roots would be +369 and −20, but ordinarily accuracy to two or three decimal places is desirable. By "cutting and trying" several times, the writer found that the roots were between +369.1336 and +369.1337, and −20.1336 and −20.1337.

This cutting and trying took more time than it did to substitute in the general quadratic equation, $X = (-B \pm \sqrt{B^2 - 4AC}) \div 2A$, from which the roots were found to be +369.13366 and −20.13366.

H. G. TAYLOR,
Indianapolis, 7, Ind.

Electric Fan Keeps Mixer Running on Continuous Pour Job

The fan belt of the portable mixer being used at Clinton, Iowa, by crews of the Weitz Company, Inc., Des Moines, in constructing a concrete silo with slip forms broke. A new belt could not be obtained. The construction schedule required continuous placing for 80 hours, but an overheated motor and a shut down appeared imminent until an electric fan from the job office was placed in

operation in front of the mixer as shown by accompanying picture, work continuing much as before.

Shown inspecting the emergency set up are: Art E. Cossens (left) general superintendent for the contractor, and Richard Hess, general foreman.

The work was being done as part of a $375,000 job.

laborious job. Working in total darkness, usually using one hand, the diver would guide the sling down on one side of the steel to be removed. With the sling hanging vertically beside the steel to be removed, a ¾-in. rope was passed under the steel and up to a barge located on the other side of the member. A firm pull on the rope bent the sling under the steel and up on the other side of the piece.

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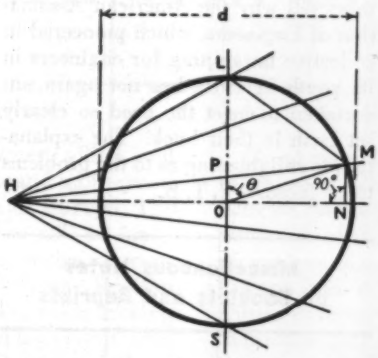

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Book Notes and Reviews

The month's addition to the engineer's reading and reference list

Collective Bargaining

TECHNOLOGISTS' STAKE IN THE WAGNER ACT—M. E. McIver, H. A. Wagner, M. P. McGirr. 270 pp. Published by the American Association of Engineers, 8 South Michigan Ave., Chicago 3, Ill. Price $2.

Employee engineers, architects and chemists will find in this book the fullest answers yet published to questions as to their status under the National Labor Relations Act. The authors have made a careful study of all decisions of the National Labor Relations Board and of the board's annual reports as they affect professional men and technologists, and from that study have attempted to point out their significance for professional employees.

One of the minor defects of the book is that this interpretation of the act and the board's application of it is overextended. Too much space is given to the authors' opinions, and in a few instances these are open to question. There are some errors such as the statement that the American Society of Civil Engineers makes a B.S. degree an arbitrary requirement for membership in the collective bargaining units to be organized by its local sections. These errors, however, detract little from the general value of the book.

Especially valuable are the chapters in the latter part of the book on appropriate bargaining units, on selecting a representative and on the actual process of collective bargaining. They give in considerable detail the experience of organizations set up to act as collective-bargaining agencies for engineer in large industrial corporations.

Those interested in the broad subject of the relations of professional men to the union question will find these chapters informative, and they will find much food for thought in the statements in the appendix by representative of the American Society of Civil Engineers, National Society of Professional Engineers, American Chemical Society and the American Institute of Chemists as to the attitude of those organizations toward collective bargaining.

In a concluding statement the authors tell why the American Association of Engineers, which pioneered in collective bargaining for engineers in its youth in 1919, has not again undertaken to meet the need so clearly set forth in their book. The explanation is enlightening as to the problems to be faced.—V. T. B.

Miscellaneous Notes on Booklets and Reprints

POSTWAR PUBLIC WORKS PLANNING PROGRESS in New York State is detailed in the Second Interim Report—1944, issued by the New York State Postwar Public Works Planning Commission, State Office Bldg., Albany 1, N. Y.

A TENTATIVE REPORT on structural failures in welded ship construction has been published by the American Welding Society, 33 West 39th St., New York 18, N. Y. (25c.). This report is an extension of the principles set forth in the society's previously published report "Thermal Stresses and Shrinkages in Welded Ship Construction."

COMPOSITE DECKS FOR BRIDGES are described in a pamphlet entitled "Pre-Fabricated Composite Deck Panels with Improved Fastenings," which has been published by the Service Bureau, American Wood Preservers Association, 111 W. Washington St., Chicago 2, Ill. The pamphlet replaces an earlier pamphlet entitled "Timber-Concrete Composite Decks." It gives improved designs that have been developed since the first booklet was prepared.

TO STIMULATE THINKING on the solution of the housing problems of the postwar era, the Producers Council (815-15th St. N. W., Washington 5, D. C.), has re-issued its pamphlet entitled "Toward a Postwar Housing Program," which was issued originally in May of this year. The pamphlet covers the organization and functioning of housing agencies, nancing home ownership, rental ho ing, maintenance and repair, mo gage legislation and title syste protection of purchasers, public ho ing and development of cities. Sin copy, $1.

New Engineering Books

CONVERSION FACTORS AND TABLES—By O. Zimmerman and Irvin Lavine. 262 Industrial Research Service, Dover, N. $2.75.

WE BUILD, WE FIGHT—The Story of t Seabees—By Hugh B. Cave. 122 Harper & Brothers, New York. $2.50.

STATICALLY INDETERMINATE STRUCTURE— R. Gartner. 93 pp. Published by Concr Publications Ltd., 14 Dartmouth Westminster, S.W.1., England. Price

REINFORCED CONCRETE AND MASON STRUCTURES, 2nd Edition—By George Hool and W. S. Kinne. 833 pp. McGra Hill Book Co., New York and London.

CLIMATE AND THE ENERGY OF NATIONS— S. F. Markham. 236 pp. Oxford Univ sity Press, New York. $3.50.

REINFORCED CONCRETE WATER TOWE BUNKERS, SILOS AND GANTRIES, 2nd E tion—By W. S. Gray, 230 pp. Concr Publications Ltd., 14 Dartmouth London S.W.1., England. Price 10s.

ARC AND ACETYLENE WELDING—By Ha Kerwin. 240 pp. McGraw-Hill Book C New York and London. $2.50.

ESSENTIALS OF AERIAL SURVEYING A PHOTO INTERPRETATION — By Talb Abrams. 289 pp. McGraw-Hill Book C New York and London. $3.

BASIC STRUCTURES—By F. R. Shanley. pp. John Wiley & Sons, Inc., New Y and Chapman & Hall, Ltd., London. $4.

NATIONAL FIRE CODES FOR BUILDING CO STRUCTION AND EQUIPMENT, 1944—Co piled by Robert S. Moulton. 511 pp. N tional Fire Protection Association, Batterymarch St., Boston 10, Mass. $3.

TECHNOLOGISTS' STAKE IN THE WAG ACT—By M. E. McIver, H. A. Wag and M. P. McGirr. 260 pp. Americ Assn. of Engineers, Eight So. Michig Ave., Chicago 3, Ill. $2.

Reports and Pamphlets

REPORT OF THE CINCINNATI WATER WO for the years 1938, 1939, 1940, 1941 1942. Cincinnati, Ohio.

DUBUQUE IOWA—44th Annual Report the Water Department. April 1, 1 March 31, 1944.

(*Continued on page* 116)

The Economic Reconstruction of Europe

THE time is fast approaching when allied and enemy populations alike will demand a blueprint for the economic reconstruction of Europe. The ace plans following this World War will be writ- piecemeal, and by experts, at a series of con- ing conferences, such as Hot Springs, Bretton oods, Dumbarton Oaks and Quebec, each tracing new pattern for negotiation and each dealing with single, specific problem. In the drawing of these ans, the United States, as owner of more than lf of the world's industrial capacity, controller of e only great credit reservoir, and possessor of the rgest force of highly skilled technicians and man- ement engineers, has heavy responsibilities which industrial, financial, agricultural and labor leaders nnot evade.

☆ ☆ ☆

Just what is the problem which the world's busi- ss leaders must help solve in Europe?

The best safeguard of peace is economic oppor- nity—a good chance for all peoples to raise their ndard of living by their own ingenuity, foresight d industry.

Frustrated and disappointed peoples, who view e future with misgiving rather than hope, breed natical demagogues who seek to divert nations m their ills and disappointments by promising litary glory and conquests.

Consequently, an important step in building a ure and lasting peace is to open the doors of portunity to the peoples of Europe.

The greatest obstacle to opportunity in Europe s been economic nationalism.

The economic tradition of the Continent always s been highly nationalistic. The national feeling nerated by the first World War, and the political onomy conferred upon many peoples by the peace aties, led to a great growth of economic restric- ns. This trend was accentuated by the depression d by the military plans of the Fascists and Nazis. ler had to show his people they could be fed n if a blockade was imposed again. The inevita- result of these influences was to carry self- ficiency to tragic extremes.

Economic nationalism holds down the standard of ng of Europe in two ways:

It prevents the rise in most European countries of low-cost mass production.

It operates against an efficient geographical division of labor, preventing nations from doing what each can do best.

Great machines require great markets. One great machine of which the United States has many and Europe few is the continuous strip steel mill. At the outbreak of the war we had twenty-eight such mills of various sizes, England but one, and Continental Europe one. A building containing one of these machines is more than a quarter of a mile long and the minimum cost of the mill is almost $25,000,000. Only the prospect of a mass market justifies production on this vast, but highly economic basis.

The wasteful geographical distribution of production is shown by the agricultural policies of Italy, France and Germany.

In the 1930's, when lard sold for less than 8¢ a lb. in the United States, it cost 32¢ a lb. in Germany. In Italy and Germany imports of wheat were banned and its production at home was heavily subsidized. By the middle of the 1930's, wheat sold for $1.55 a bushel in France, $1.97 in Czechoslovakia, $2.29 in Germany, and $2.47 in Italy. At the same time the United States and the other efficient world producers and exporters (Canada, Australia and Argentina) were *restricting* production and were unable to average more than about 75¢ a bushel for their wheat.

Economic unity in Europe must ultimately mean a freedom to trade not greatly different from what we have within the United States. Given economic unity and the large markets which go with it, efficient mass production will develop. With Europe receiving cheap supplies of such staple foods as wheat, pork, lard and dried fruits from overseas, European farmers can prosper by specializing in producing fresh foods—butter, cheese, eggs, fruits, vegetables.

Then European agriculture will be more prosperous producing its specialties, and our agriculture (and that of the other great efficient surplus-producing countries as well) will have greatly expanded markets for our staples.

With a cheaper food supply for Europe—yet one yielding a better price for our agriculture—European labor will live better. Labor now used uneconomically for agricultural production will be released for industry. With big machines and semi-automatic processes European labor can produce more steel, automobiles, furnaces, plumbing and electrical appliances to advance its standard of living in coming decades, as the United States has done in past decades.

A rising standard of living in Europe will bring

Europeans to view peace with optimism and hope. And world trade grows as confidence and prosperity widen.

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How would a Europe which possesses economic unity appear to us on this side of the Atlantic?

It would be a prosperous Europe that would have strength in its advancing industries, but as the single great agricultural deficit area of the world, it would be dependent upon overseas supplies for vital agricultural staples. This dependence upon overseas agricultural supplies would be greatest for industrial Germany. Some people believe that a strong Europe would be a threat to world peace. More important, however, is the fact that a strong and prosperous Europe would not be a frustrated Europe. It would have found a way to achieve a rising standard of living. Furthermore, a prosperous Europe would, economically, be a dependent Europe because, although the European industrial worker would use more and cheaper food, he would have it only as long as he maintained the peace.

A prosperous Europe would be of special advantage to American agriculture (if we do not keep on pricing ourselves out of the market) and of great advantage to American industry.

The British policy of buying agricultural staples from abroad, for example, made her, a nation of only 45,000,000, the purchaser, in 1937, of $250,000,000 of all kinds of agricultural products from the United States. In the same year the rest of Europe (exclusive of Russia), with a population of 325,000,000 purchased only $300,000,000 of our agricultural products. But with more sensible organization of its agriculture, Europe could be expected to buy more than one billion dollars of agricultural products from us.

By far the greatest market for an expanded European industry will be Europe itself.

For American industry, there will be growing markets in Europe as industry expands. Experience shows that the trade between different highly industrialized areas is large. This country's biggest export markets have been with its keenest competitors—Britain, Canada, Japan, France and Germany.

Before the war, Europe, with two and one-half times the population of the United States, had only one-sixth as many automobiles.

If Europe (exclusive of Britain and Russia) were to motorize proportionately, it would need 75,000,000 automobiles. With normal depreciation this would ultimately mean 10,000,000 cars to be produced annually to replace worn out cars.

If one still wonders about the immense number of things Europe might produce *for herself*, let him calculate the highway expenditures, the filling and repair station businesses that must be equipped and maintained; and the doubling of the steel production that would be required to make the automobiles themselves and to reinforce with steel even a moderate amount of additional concrete highways.

Another example is the electrification of Europe. With two and one-half times our population Europe's consumption of electrical energy would be 175 million electrical H.P., if the European worker were to have the advantage of as many H.P. as the American. Yet, just prior to the war, Europe's installed operating capacity was only about 40 per cent of this figure.

☆ ☆ ☆

What has been sketched for Europe is actually much more nearly a page from the economic history of the United States than it is mere prophecy about a desirable future for a Europe at peace. But how can it be achieved? And what is our part to be in helping to bring it about?

Economic unity can be provided for the sovereign states of Western Europe by the peace treaty or treaties adopted at the end of the war. The provisions for securing *economic unity* in Europe should specifically cover:

1. Substantial freedom for persons and enterprises to do business anywhere in Europe.
2. Reasonably free movement throughout Europe of persons for employment, recreation and education.
3. Greatly increased freedom of trade:
   a. Within Europe—through the application of a Europe-wide agreement reducing the tariffs among all European countries to a maximum of 10 or 15 per cent.
   b. With the rest of the world—through reduction of European tariffs on goods bought from overseas. This would call for generally lower levels on manufactured goods, and for the removal (after a reasonable period of progressive reduction) of tariffs on all agricultural foodstuffs and most industrial raw materials.
4. A special currency provision requiring as nearly as practicable complete currency stabilization for all countries of Western Europe among each other.
5. Creation of an agency (with adequate revenues) through which all Europe-wide business and other affairs affected by these agreements would be administered for a minimum period of twenty-five years.

This would permit the economic unity of Europe to be substantially achieved. During this period assistance in administering the provisions would be given by officials of the United Nations.

Near the end of such a period arrangements could be made for a vote in the European countries on whether or not to continue the "unification provisions." If the vote were in the negative, the United Nations would have proper warning that additional safeguards would be necessary to prevent war.

The suggestions made in this statement aim at securing economic unification of Europe and thereby promoting the possibilities of permanent peace in Europe.

The realization of these possibilities throughout the postwar years requires a freely expressed public opinion in Europe to guide all who share the responsibility for bringing peace to Europe and to the world.

James H. McGraw, Jr.

President McGraw-Hill Publishing Company, Inc.

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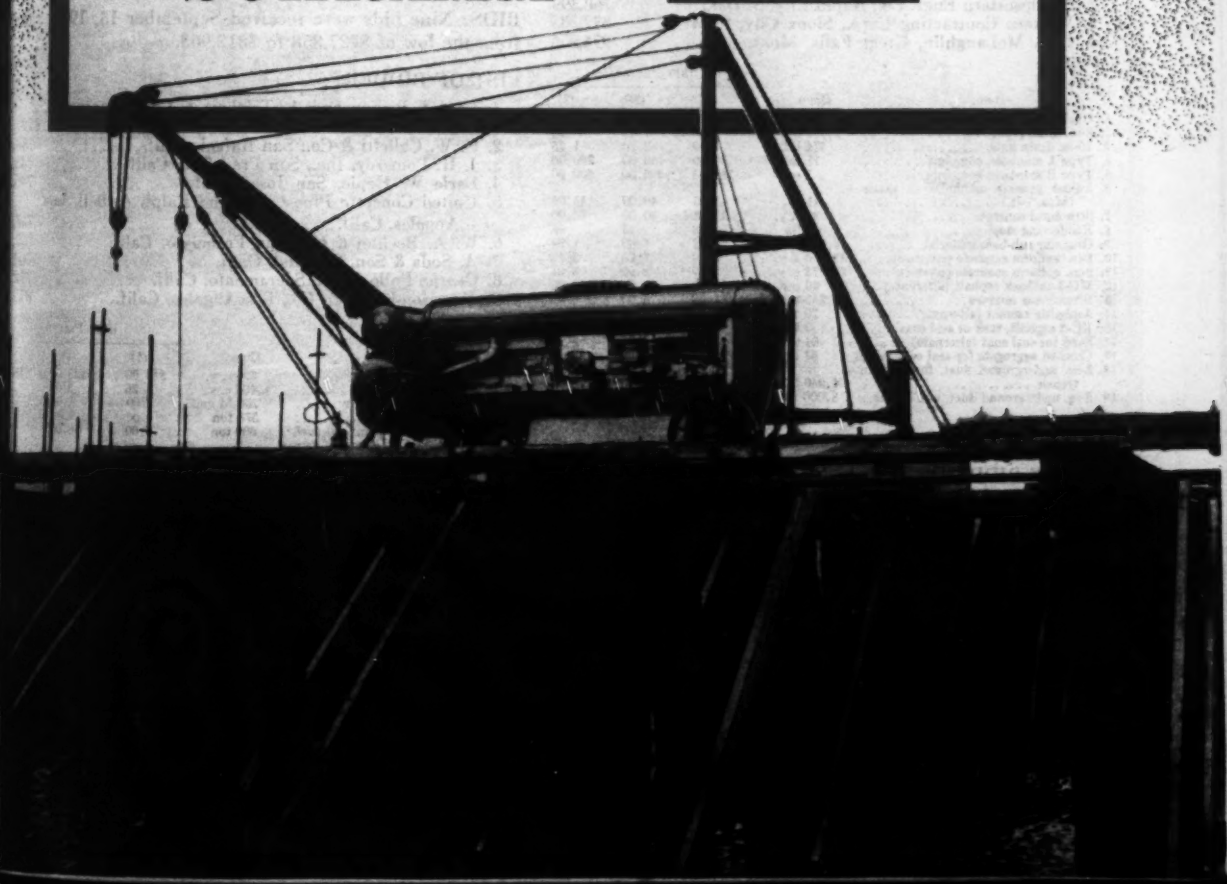

CONTRACT UNIT PRICES

What contractors are bidding on different kinds of construction work

EXTENDING AIRPORT SHERIDAN, WYOMING

OWNER: Civil Aeronautics Administration, Kansas City, Mo.

PROJECT: Enlarging and improving the Sheridan County Airport, Sheridan, Wyo., including necessary grading, drainage, bituminous paving, and other incidental work. NE-SW runway to be extended to 5,000-ft. length and 150-ft. width; construction of N-S runway, 5,000-ft. by 150-ft., including the required grading and drainage; reconstruction of NW-SE and NE-SW runways; extending NW-SE runway to 150-ft. by 6,000-ft.; and construction of apron and 50-ft. taxiway. Bids were asked on concrete and bituminous pavement. Contract was let on latter basis.

CONDITIONS: Contractor to furnish all materials and complete work in 92 weather working days. Highway facilities available to site of work, and rail transportation three miles northeast. Wage rates specified are: 65c. per hour for common building labor; and 65c. for common labor on heavy construction.

BIDS: Four bids were received June 5, 1944 on Schedule 1 (concrete), ranging from $618,382 to $974,956. Six bids were opened on Schedule 2 (bituminous) ranging from the contract low of $480,846 to $745,802.

Schedule 1—Concrete Paving

LIST OF BIDDERS: (No award on this basis)

1. Peter Kiewit Son's Co., Sheridan, Wyo. (low bidder) $618,382
2. Northwestern Engr. Co., Rapid City, S. Dak. 768,399
3. Western Contracting Corp., Sioux City, Iowa 877,333
4. J. L. McLaughlin, Great Falls, Mont. 974,956

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Unclassified excavation	227,600 c. y.	$0.20	$0.25	$0.41
2. 8-in. drain pipe	2,762 l. f.	1.33	1.40	.90
3. 10-in. drain pipe	574 l. f.	1.49	2.20	1.25
4. Type A manhole, complete	11 ea.	86.10	150.00	200.00
5. Type B manhole, complete	1 ea.	145.95	225.00	600.00
6. Adjust present manholes to grade (Mar. 1-ft.)	11 ea.	43.05	40.00	45.00
7. Structural concrete	20 c. y.	33.81	30.00	35.00
8. Reinforcing steel	1,000 lb.	.08	.12	.08
9. Granular sub-base material	44,960 c. y.	1.03	1.00	1.28
10. 8-in. uniform concrete pavement	132,256 s. y.	2.19	2.70	2.93
11. 9-in. uniform concrete pavement	97,873 c. y.	2.29	2.90	3.21
12. MC-3 cutback asphalt (alternate)	90 ton	19.79	28.00	23.00
13. Bituminous mixture	1,345 ton.	1.38	5.00	6.00
14. Asphaltic cement (alternate)	70 ton	151.17	25.00	22.00
15. RC-3 asphalt, tack or seal coat	9 ton	19.79	30.00	25.00
16. Sand for seal coat (alternate)	64 ton	2.40	4.00	3.15
17. Crushed aggregate for seal coat (alt.)	64 ton	2.73	5.00	3.15
18. 3-in. underground duct, first run in trench	4,960 l. f.	.42	1.00	.90
19. 3-in. underground duct, add'l. runs	8,000 l. f.	.35	.50	.70

Schedule 2—Bituminous Paving

LIST OF BIDDERS: (Crushed aggregate alternate)

1. Peter Kiewit Son's Co., Sheridan, Wyo. (contract) $480,846
2. Northwestern Engr. Co., Rapid City, S. Dak. 551,321
3. Inland Constr. Co., Omaha, Nebr. 591,893
4. J. L. McLaughlin, Great Falls, Mont. 680,490
5. Schroeder & Co., Inc., Roscoe, Calif., and B. W. Hampton Co., Inc., Santa Ana, Calif. 704,707
6. Brown Construction Co., Pueblo, Colo. 745,802

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Unclassified excavation	227,600 c. y.	$0.20	$0.25	$0.94
2. 8-in. drain pipe	2,762 l. f.	1.33	1.40	1.30
3. 10-in. drain pipe	574 l. f.	1.49	2.20	1.60
4. Type A manhole, complete	11 ea.	86.10	150.00	165.00
5. Type B manhole, complete	1 ea.	145.95	225.00	250.00
6. Adjust present manholes to grade	11 ea.	43.05	40.00	62.50
7. Structural concrete	20 c. y.	33.81	30.00	62.50
8. Reinforcing steel	1,000 lb.	.08	.12	.08
9. Granular sub-base material	162,800 c. y.	.95	.95	.95
10. MC-1 asphalt for prime coat	136 ton	18.88	24.00	20.00
11. Bituminous mixture, base	61,800 ton	1.97	2.82	2.00
12. Bituminous mixture, surface	23,800 ton	2.25	2.70	2.00
13. Bituminous mixture, special surface	3,060 ton	2.47	3.00	4.00
14. Asphaltic cement	4,500 ton	16.00	18.50	19.00
15. Asphalt for tack coat	288 ton	18.88	23.00	20.00
16. Asphalt for seal coat	190 ton	19.58	25.00	21.00
17. Sand for seal (alternate)	1,790 ton	2.40	3.50	3.00
18. Crushed aggregate for seal (alternate)	1,790 ton	2.73	3.90	3.00
19. 3-in. underground duct, first run	4,960 l. f.	.42	1.00	1.00
20. 3-in. underground ducts, add'l runs	8,000 l. f.	.35	.50	.50

BRIDGE RECONSTRUCTION, CALIFORNIA

OWNER: California State Division of Highways, Sacramento

PROJECT: Reconstructing a portion of the existing bridge across the Sacramento River at Rio Vista, Sacramento County, Calif. Involves necessary excavation; roadway surfacing; furnishing and driving both timber and steel piles; furnishing and erecting required structural steel; furnishing and placing steel reinforcing bars; steel railing; electrical equipment and other miscellaneous items of work necessary for completion of project.

CONDITIONS: Contractor to furnish all materials except two electrolier standards, which will be furnished by the state. Highway transportation facilities available. Wage rates specified are: skilled labor, $1.25 to $1.75 per hour; semi-skilled, 90c. to $1.3125; and common, $1.00. Preference rating AA-3.

BIDS: Nine bids were received September 13, 1944, ranging from the low of $727,858 to $812,963.

LIST OF BIDDERS:

1. Lord & Bishop and A. Teichert & Co., Sacramento, Calif., (low bidder) $727,858
2. C. W. Calletti & Co., San Rafael, Calif. 733,
3. J. H. Pomeroy, Inc., San Francisco, Calif. 745,7
4. Earle W. Heple, San Jose, Calif. 746,6
5. United Concrete Pipe Corp., and Ralph A. Bell, Los Angeles, Calif. 747,2
6. W. A. Bechtel & Co., San Francisco, Calif. 755,1
7. A. Soda & Son, Oakland, Calif. 764,9
8. George Pollock Co., Sacramento, Calif. 772,6
9. Morrison-Knudsen Co., Los Angeles, Calif. 812,9

Item	Quan.	Unit Prices (1)	(2)	
1. Structure excavation	2,800 c. y.	$10.00	$25.00	
2. Imported borrow	4,400 c. y.	1.25	2.00	
3. Furnish and apply water	200 M gal.	2.00	4.00	
4. Crusher run base	575 ton	4.00	4.00	
5. Mineral aggregate plant-mix surf.	600 ton	5.00	6.00	
6. Liq. asph. MC-3 plant-mix surfacing	23 ton	20.00	40.00	
7. Liq. asph., MC-3 prime coat	4 ton	40.00	40.00	
8. Rock and screenings for bitum. macadam	60 ton	7.00	10.00	
9. Paving asphalt, bituminous macadam	5 ton	30.00	40.00	
10 Douglas fir timber	74 Mfbm.	200.00	200.00	
11. Cl. A portland cement conc.; footing blocks	1,015 c. y.	30.00	30.00	
12. Class A portland cement; structures	2,090 c. y.	40.00	42.00	
13. Furnish structural steel	328,800 lb.	.08	.075	
14. Erect structural steel	328,800 lb.	.05	.037	
15. Furn. treated Douglas fir piles	6,000 l. f.	1.50	1.50	
16. Drive timber piles	75 ea.	80.00	100.00	
17. Furnish steel piles	19,040 l. f.	2.50	2.00	
18. Drive steel piles	406 ea.	40.00	100.00	
19. Friction fins	350 ea.	10.00	10.00	
20. Furnish bar reinforcing steel	320,000 lb.	.04	.04	
21. Place reinforcing steel	320,000 lb.	.025	.02	
22. Steel railing	2,722 l. f.	6.00	8.00	
23. Electric equipment	Lump Sum	4,000.00	2,500.00	
24. Misc. items of work	Lump Sum	5,000.00	10,135.00	

IT HAD TO BE DONE ... AND WE DID IT!

Early in 1940 the Navy Department began to visualize a possible shortage of steel plate. Reinforced concrete tanks for fuel storage were suggested if they could be so lined as to prevent seepage of the gasoline.

BWH engineers solved the problem by lining the tanks with a thin sheet of synthetic rubber, covering walls, floors and columns like wall paper. This not only prevented seepage but protected the gasoline from a drop in octane rating.

Another example of BWH ingenuity and resourcefulness in applying rubber to a difficult problem.

BOSTON WOVEN HOSE & RUBBER COMPANY

WORKS: CAMBRIDGE, MASS., U.S.A. P.O. BOX 1071, BOSTON 3, MASS., U.S.A.

MATERIALS AND LABOR PRICES

Market quotations on construction materials and wage rates reported monthly by ENR correspondents

CONSTRUCTION MATERIAL prices and labor rates for October show increases in Portland cement to be the most important change from a month ago. Increases of 10c. per barrel are reported in Cleveland, Detroit and Pittsburgh, and a 1c. rise in New Orleans. Price bases at mills have been increased at Ironton, Ohio, and Universal, Pa. Ready-mixed concrete is 15c. per cubic yard higher in Cleveland.

Vitrified sewer pipe is higher in Kansas City, Los Angeles, Minneapolis and New Orleans as a result of an OPA-authorized increase. Lumber prices are unchanged fro a month ago, but railway ties are higher in St. Louis. Steel products remain at Septemb levels. Roofing supplies are up in both Pittsburgh and St. Louis.

Common labor rates in St. Louis for both building and heavy construction are up 5 and are now quoted at $1.00 per hour. Skilled labor rates report no change from la month.

CEMENT, AGGREGATE, READY-MIXED CONCRETE—F.O.B. CITY

	PORTLAND CEMENT—Per bbl., C/L lots, incl. 40c. per bbl. for bags, cash dis. not deducted			SAND AND GRAVEL—Per ton, carload lots			CRUSHED STONE Per ton, carload lots		CRUSHED SLAG Per ton, carload lots, f.o.b. plant		CONCRETE BLOCK 8x8x16-in.; truckload del.; per block		CONCRETE Ready Mix 1:2:4, 6
	Cloth *a*	Paper	Bulk	Gravel, 1½ in.	Gravel, ¾ in.	Sand	1½ in.	¾ in.	1½ in.	¾ in.	Sand-grav.	Lt.wgt. Agg.	50 c.y., d
Atlanta	$2.77	$2.52	$2.47	$1.79	$1.89	$1.99	$1.79	$1.89	$1.59	$1.69	$0.17	....	$8.00
Baltimore	2.53	2.28	2.03	1.75‡	1.75‡	1.25‡	1.75‡	1.75‡	1.75‡	1.75‡	.125	$0.125*w*	7.35
Birmingham	2.50	2.25	2.10	1.75	1.75	1.50	.85	1.00	.90	1.15	.1425	....	5.80
Boston	2.97*b*	2.72*b*	2.52	1.50‡	1.50‡	1.05‡	1.25‡	1.35‡	....	....	.13	.155*w*	7.55
Chicago	2.70	2.45	2.30	2.15‡*d*	2.15‡*d*	2.15‡*d*	2.15‡*d*	2.15‡*d*	1.75‡	1.75‡	.16	.16*x*	....
Cincinnati	2.31	2.06	1.81	1.20	1.20	1.10	1.80	1.80	....	....	.12	.15*w*	6.60
Cleveland	2.49	2.24	....	1.75*i*	1.75*i*	1.55*i*	1.80*i*	1.80*i*	1.73*i*	1.73*i*	.14	.14	7.45
Dallas	2.52	2.27	2.07	1.50*p*	1.70*p*	1.10*p*	1.69*p*	1.79*p*	....	....	.15	....	6.30
Denver	3.08	2.83	2.32	1.20	1.30	1.25	1.65	1.75	1.00	1.00	.15	....	7.35
Detroit	2.49	2.24	2.09	1.50	1.50	1.50	2.25	2.25	2.00‡	2.00‡	.13	.14*w*	7.00
Kansas City	2.58	2.33	2.18	1.85	2.30	1.00	1.91	1.91	....	....	.125	.125*wy*	7.80
Los Angeles	3.00*v*	2.40*v*	....	1.30	1.30	1.15	1.30*f*	1.30*f*	....	....	.04½*bb*	.10*aa*	7.25
Minneapolis	2.90	2.65	....	1.00*h*	1.00*h*	.25*h*	1.60*h*	1.00*h*	....	....	.12	.16	7.10
Montreal	....	1.95*rs*	1.79*rs*	1.65‡*s*	1.65‡*s*	1.50*t*	.80*ct*	.90*ct*	....	....	.14*t*	.14*wt*	7.00
New Orleans	2.42	2.16	1.96	1.67	1.65	1.22	....	....	....	....	.19	....	9.25
New York	2.89‡	2.64‡	....	1.60*de*	1.60*de*	.90*de*	1.70*de*	1.80*de*	....	....	.16	.14*ecc*	7.75
Philadelphia	2.73	2.48	2.28	1.55‡	1.65‡	1.20‡	1.90	1.95	1.10	1.10	.155	.155*w*	8.45
Pittsburgh	2.55	2.30	2.10	1.65‡	1.65‡	1.85*dd*‡	2.25‡	2.25‡	1.50	1.50	.17	.17*c*	8.25
St. Louis	2.80	2.52	....	1.75‡	1.75‡	1.25/1.50‡	1.10*h*	1.10*h*	.75*g*	.75*g*	.145	.13*w*	8.00
San Francisco	....*u*	2.21	1.91	1.36	1.36	1.36	1.46	1.46	....	....	....	.20*y*	7.65
Seattle	2.95*o*	2.75*o*	....	1.00*o*	1.00*o*	1.00*o*	2.00*o*	2.00*o*	....	....	.16	.16*y*	7.25

‡ Delivered. *a* 10c. allowed for each returnable bag *b* 10c. per bbl. off for cash. *c* F.o.b. quarry. *d* Per cu. yd. *e* Barge lots alongside docks. *f* Crushed granite. *g* F.o.b. Granite City, Ill. *h* F.o.b. plant. *i* Within three miles of Public Square. *j* 5% discount for cash. *k* Discount of 2 percent for cash in 10 days. *l* Up to 200 cu. yd. *m* 50c. off for cash. *n* 25 c.y. or more. *o* 2% off for cash. *p* 10c. per ton off, cash 15 da *r* 10c. per bbl. off, cash 20 days. *s* 8% sales tax included. *t* 8% sales not included. *u* Price withdrawn. *v* 20c. per bbl. discount; 20c. allowed returnable cloth bag. *w* Cinder. *x* Waylite. *y* Haydite. *z* Celocrete. *aa* Pumi *bb* 4 x 8 x 12 in. *cc* Also 8 x 18 x 18 in.

CASH DISCOUNTS CEMENT to Contractors: truck delivery, 2% for cash on 10th of month; on carload deliveries, no trucking, same as dealer cash disco 10c. per bbl. for payment within 15 days of date of invoice. Subject discount 10c. per bbl. 20 days in Montreal.

CURRENT MAXIMUM PRICE BASES AT CEMENT MILL

Charge for bags not included. For cloth bags, add 40c. per bbl.; 10c. refund allowed for each returnable bag; for paper bags add 15c. per bbl., not refundable.

	Bagged	Bulk		Bagged	Bulk		Bagged	Bulk
Buffington, Ind.	$1.70	$1.65	Ironton, Ohio	$1.70	$1.65	Richard City, Tenn.	$1.80	$1.75
Dallas, Tex.	....	....	Limedale, Ind.	....	....	Steelton, Minn.	1.80	1.75
Hannibal, Mo.	1.70	1.65	Norfolk, Va.	....	....	Universal, Pa.	1.75	1.70
Hudson, N. Y.	....	....	Northampton, Pa.	1.75	1.70	Waco, Tex. (Plus 9c. tax in Tex.)	1.75	1.70
Independence, Kans.	1.70	1.65	North Birmingham, Ala.	....	....	Montreal (8% sales tax incl.)	1.68	1.65
						Discount 10c. per bbl. 20 days		

PAVING BRICK, BLOCK, ASPHALT, ROAD OILS—F.O.B. CITY

	PAVING BRICK AND BLOCK Granite per M. lots of 50,000 4x4x8 in.	Brick per M 3x4x8½ in. carload lots	Wood per sq. yd. 3½ in. 16-lb. treat	PAVING ASPHALT Per ton, less than 80 penetration Tank car	Drums	ASPHALT BINDERS—FLUXES Per gal., 80-300 penetration Tank car	Drums	CUTBACK ASPHALT Per ton Tank car	Drums	ROAD OIL Per gal. Tank car	ASPHALT EMULSION (Quick-breaking) Per gal. Tank car	Drums
Atlanta	$73.00	$39.35	$2.25	$18.53*e*	$24.92*e*	$0.0740*e*	$0.1309*e*	$0.0802*hh*	$0.1348*h*	$0.0676*e*	$0.0826	$0.13
Baltimore	150.00‡	49.00	32.50*m*	15.00*r*	21.00*r*	.06*r*	.09*r*	13.00*r*	23.00*r*	.065*r*	.07*r*	.1
Birmingham	150.00	48.00	....	17.95	.....†	.0747	.....†	.0834*h*	.....†	.065	.09	.....
Boston	85.00	59.00	3.75	17.00	24.00	.20	.22	25.00	30.00	.....	.1125	.12
Chicago	150.00	55.00	2.50/2.80*d*	14.00	22.50	13.00*g*	21.50*g*	.0575*h*	.15*h*	.05*n*	.09/10*n*	.13/.1
Cincinnati	120.00	50.00	.....	16.40	.....	.085	.....	12.35	.....	.07	.085	.....
Cleveland	118.00	37.25	2.50	16.00	18.00	.085	.095	.10*h*	.....	.095	.095	.....
Dallas	.....	36.00	.....	13.65	20.30	.06	.11	16.00	24.80	.06	.05/.07	.07/.1
Denver	.....	16.11	.....	11.00	.....	10.00	.....	.045*h*	.....	.....	.....	.....
Detroit	.....	37.00	.....	18.06*f*	25.60*f*	.0743	.128	.0718*h*	.110*h*	.067	.0775	.11
Kansas City	.....	40.00	.....	18.50	23.50	.077	.1075	.077*h*	.107*h*	.057	.11	.15
Los Angeles	.....	50.00	.....	9.00*b*	23.00	9.50*bg*	24.00*bg*	9.50*b*	.....	.025	.072	.10
Minneapolis	.....	.....	2.30*d*	.....	27.70	.....	.126	.....	32.64	.....	.....	.....
Montreal	92.40	.....	.....	16.60*k*	24.25*k*	.116*k*	.1485*k*	.115*hk*	.135*hk*	.08*k*	.135*k*	.18
New Orleans	.....	.....	.....	13.50*a*	20.00*a*	.057	.088	.06*h*	.095*h*	.....	.080	.....
New York	.....	65.00	.....	17.40	24.20*p*	14.00	.....	.0725*h*	.1325*hp*	.....	.0725*p*	.11
Philadelphia	140.00	58.00	4.06	15.00*r*	.....	14.00*r*	.....	.065*hr*	.....	.....	14.00*r*	.....
Pittsburgh	135.00	38.75	.....	18.00	23.00	.09	.16	20.00	36.00	.07	.06	.11
St. Louis	.....	37.00	.....	16.00	22.00	15.00*g*	21.00*g*	.057*h*	.1212*h*	.648	.06	.11
San Francisco	.....	40.00	.....	10.90	21.15	10.90*g*	18.00*gr*	12.90	17.50*r*	9.50*gr*	.0525	.12
Seattle	.....	60.00*e*	.....	10.90*i*	23.40*i*	.....	20.40*gi*	11.40*i*	.....	.....	.0525*i*	.09

‡ Delivered. *a* F.o.b. Baton Rouge. *b* Delivered to purchaser's warehouse. *e* 3½x4x8½ in. *d* 2½ in. 12-lb. treatment. *e* Local reduction due to 20% reduction intra-state class freight rates, only Georgia affected. *f* Mexican. *g* Per ton. *h* Per gallon. *i* F.o.b. Martines. *j* 3x3½x8½ in. *k* Tax included. *hh* thousand. † Available on priority only and quoted specially. *p* No steel d shipments except to armed forces. *r* February 1943 prices, none later avail

JOBS WANTED!

by

HEAVY-DUTY CLUTCH WITH A WAR RECORD

To help ships maneuver faster than ever before —to help drags and shovels move earth by the million tons—to help heavy machines produce war implements 24 hours a day—those are the jobs on which the Fawick Airflex Clutch has earned its record.

Controlling power by air pressure, without levers or arms or springs, the Fawick Airflex Clutch needs no adjustments, no lubrication. It absorbs shocks and vibration and corrects for misalignment.

If you have a tough clutch or brake problem in any kind of heavy-duty service, write to our Engineering Department for information—they can help YOU.

for

DIESEL DRIVES
HEAVY MACHINES
DRAGS AND CRANES
PAPER MILLS
RUBBER MILLS
STEEL MILLS
MINE HOISTS
OIL FIELD DRIVES
SUGAR MILLS

★ ★

12 IMPORTANT OPERATING ADVANTAGES

1. Simple in design and operation
2. Flexible control by air
3. No adjustments or oiling—low maintenance
4. Dampens vibration—absorbs shocks
5. Corrects misalignment automatically
6. Smooth starting—no jerks
7. Quick stopping
8. Runs cooler—uniform pressure
9. Controls torque by air pressure
10. Greater capacity—more compact
11. Replaces couplings
12. Remote control by 4-way air valve

FAWICK AIRFLEX COMPANY, INC.
9919 Clinton Rd. Cleveland 11, Ohio

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In Britain, Crofts Engineers, Ltd., Bradford, England

FAWICK *Airflex* CLUTCH

POWER CONTROLLED BY AIR

IRON AND STEEL PRODUCTS—BASE MILL PRICES

	STRUCT. SHAPES-PLATE	REINF. BARS ¼-in. billet b	RIVETS ½-in. struc-tural	WIRE NAILS Base d	SHEET PILING Base	STEEL RAILS Per Gross Ton: Standard	Light	Re-rolled	Angle Bars	TRACK SUPPLIES: Std. Spikes e	Tie Plates e	Track Bolts
Birmingham	$2.10	$2.15	$3.75	$2.55	.....	$40.00	$40.00	$39.00	$2.70	$3.00	$2.15	$4.75
Chicago	2.10	2.15	3.75	2.55	$2.40	40.00	40.00	39.00	2.70	3.00	2.15	4.75
Pittsburgh	2.10	2.15	3.75	2.55	2.40	40.00	40.00	39.00	2.70	3.00	2.15	4.75
Buffalo	2.10	2.15	.....	.....	2.40	.....	.....	.....	.....	.....	2.15	.....
Cleveland	2.10	2.15	3.75	2.55	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown	.....	2.15	.....	.....	.....	.....	.....	.....	.....	3.00	.....	.....
Detroit	.....	2.27‡	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gulf ports	2.47a	2.52a	.....	.....	2.85a	.....	.....	.....	.....	.....	.....	.....
Pacific ports	2.75a	2.80a	.....	3.05	2.95a	.....	.....	.....	.....	.....	2.30	.....

‡ Delivered. a F.o.b. cars dock. b Rail steel same as billet prices. c Other basing points include Portsmouth, O., Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., and Pacific coast ports, on tie plates alone, Steelton, Pa., spikes alone, Lebanon, Pa., Richmond, Va. d Add switching charge $18 per

IRON AND STEEL PRODUCTS—F.O.B. WAREHOUSE, PER 100 LB., BASE PRICE

	STRUCTURAL SHAPES Per 100 lb. base price	REINFORCING BARS* Per 100 lb., ¼ in., base price: 15 tons or over b New billet	Rail steel	Add Switch	$/cwt. for Del.	EXPANDED METAL LATH Per 100 sq. yd., carload lots: Std. diamond mesh, 3.4 lb.	Std. ribbed 3.4 lb.	WELDED FABRIC REINFORCING— Per 100 sq. yd., carload lots: 4x16 in., No. 5 & 10 wires	4x12 in., No. 8 & 12 wires	6x6 in. No. 6 & 6 wires Per sq. yd.	SHEET PILING Per 100 lb. base price
Atlanta	$2.34	$2.40	$2.40	$.02½	$.10	$21.06	$23.00	$1.82	$1.35	$0.1719	$3.04
Baltimore	3.70	2.90	2.75	.....	.10	22.50	24.50	1.70	1.27	.1611	3.00
Birmingham	2.10a	2.15	2.15	.02½	.10	19.00	21.00	1.80	1.34	.1701	....
Boston	3.912	3.904	....	$20 C.L.	.10	18.50	29.50	1.76	1.31	.1656	2.77
Chicago	2.10a	2.15	2.15	.03	.05	21.50	23.50	1.67	1.25	.1575	2.49
Cincinnati	3.68	2.53cd	2.53cd	.....	.05	19.50	21.50	1.66	1.25	.1566	....
Cleveland	2.10a	2.15	2.15	.02½	.10	19.50	21.00	1.66	1.25	.1566	....
Dallas	4.25	3.17	3.17	.....	....	25.00	27.50	1.93	1.42	.1827	....
Denver	4.57	3.33kl	....	.....	....	26.50	26.50	1.97	1.45	.186	....
Detroit	3.65‡	2.52‡	2.52‡	.....	.10	30.00	30.00	1.68	1.26	.1584	2.66
Kansas City	4.19	2.61cd	2.61cd	.0	.05	24.50	26.50	1.78	1.33	.1683	2.874
Los Angeles	3.65f	2.575	2.425	.02½	.05	23.00	27.50	1.93	1.42	.1827	3.06
Minneapolis	3.81‡	2.73	2.73	.0	.10	25.00	27.00	1.80	1.34	.1701	2.72d
Montreal	3.95i	2.90i	2.80i	.....	....	26.00hij	33.00hij	2.25i	3.14i	.2281	....
New Orleans	4.229‡k	2.52	2.52	.05	.10	19.00	21.00	1.82	1.35	.1715	2.975
New York	3.75	2.76e	2.76e	.....	.15	17.50	19.50	1.76	1.32	.1665	2.74
Philadelphia	3.666	3.668	....	.....	....	19.50	21.50	1.71	1.28	.1611	2.72
Pittsburgh	2.10a	2.15	2.15	.02½	.10	23.00	26.50	1.59	1.20	.1503	2.49
St. Louis	3.697	2.74	2.74	.0	.05	28.00	34.00	1.89	1.27	.1602	2.70
San Francisco	4.35	2.825	2.675	.02½	.10	21.00	24.50	1.93	1.42	.1827	3.35
Seattle	2.75e	2.80e	....	.....	....	34.50	38.50	1.93	1.42	.1827	2.95d

‡ Delivered. a Mill prices. b 5–15 tons, add 15c. 1–5 tons, add 25c. Less than 1 ton, add 50c. c 20 tons or over Base. d Mill price plus freight. e F.o.b. dock. f Includes delivery in free delivery zone. g Less than 1 ton, add 25c.; 1 to 5 tons, add 10c. * High scrap steel prices cut former 15c. differences between billet and rail steel in many mills. h List price. i Plus Dominion and Province sales tax. j August 1942 price; not on market. k Quotation on changed basis; actual price change. l Approximate Denver price out of wholesale stocks, based on Chicago area; not comparable with preceding prices.

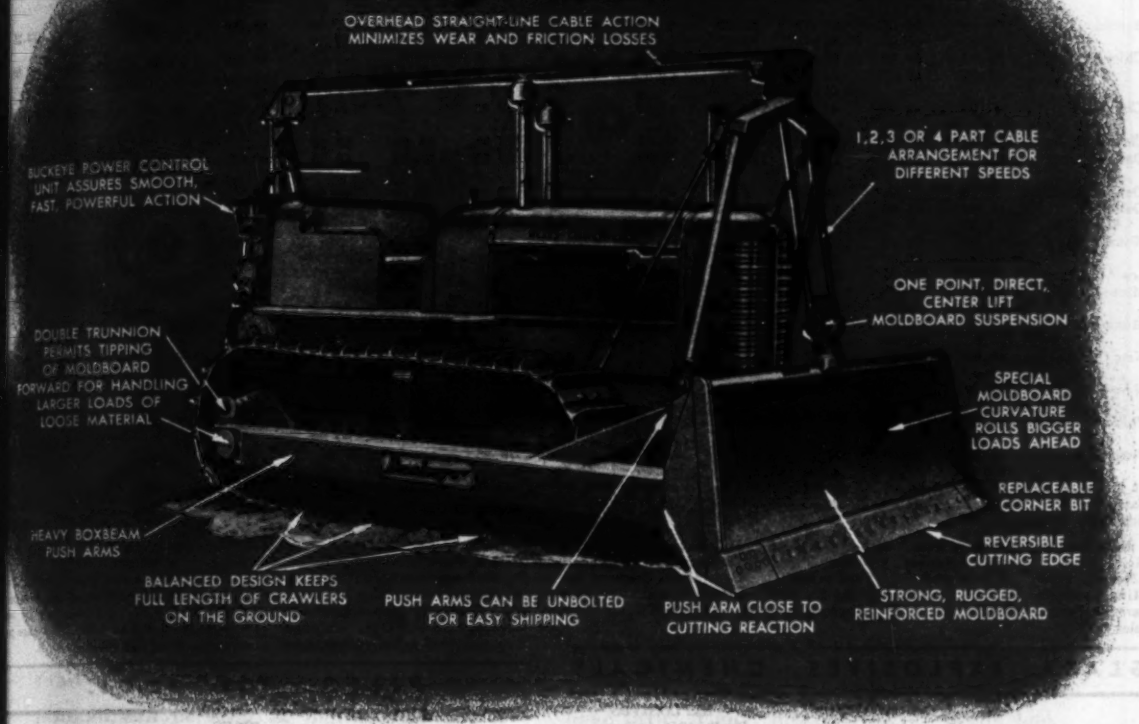
PLUMBING, HEATING, WATER, SEWER AND DRAIN PIPE

	C. I. PIPE Per net ton f.o.b. 6 in. to 24 in.a	VITRIFIED SEWER PIPE: Per foot, std. 8 in., s.s.	Delivered std. 12 in., s.s.	ASTM 24 in.,	C13-35 36 in.	CLAY DRAIN TILE Per 1,000 ft., car load lots, f.o.b.: 6 in.	8 in.	CONCRETE SEWER PIPE Per ft., delivered; ASTM 12 in.	C 14-35 24 in.	WROUGHT STEEL PIPE Full standard weight, k: 1 to 3 in., Black %	Galv. %	Butt Weld 3½ to 6 in.; Black %	Galv. %	Lap W
Atlanta	$49.66	$0.26b	$0.468bc	$1.8525	$4.68e	$85.00	$128.00	$0.45	$1.642	48.2	54.2	59.7		51.3
Baltimore	53.00	.35	.60	2.70	7.25	160.00	200.00	.55	1.80	65.5	57.5	63.0		54.5
Birmingham	45.00	.275	.495	1.95	5.50	100.00	220.00	.50	1.70	62.2	54.2	59.7		51.3
Boston	55.40	.371r	.7155r	2.79r	7.6875r	155.00‡r	245.00‡r	.60	1.95	....	....	....		....
Chicago	54.33	.35	.675	2.70	7.00	100.00‡	150.00‡	.45	1.85	66.0	55.0	64.5		53.0
Cincinnati	53.27	.231	.4455	1.80	5.125	105.00‡s	170.00‡s	.75t	1.75t	57.1	43.4	54.0		39.6
Cleveland	54.75	.266r	.513r	2.115r	5.535r	90.60	139.40	.36	1.38	68.5	57.5	66.0		51.5
Dallas	56.43	.31	.58	2.25	5.00	90.00	110.00	.46	1.57	59.9	51.9	57.3		48.3
Denver	61.56	.29†	.52†	2.16†	3.00n	125.00	200.00	1.00	2.22	58.4	50.4	55.7		47.2
Detroit	54.75	.35	.675	2.70	7.75	135.00	200.00	.40	1.75	57.6	44.0	54.5		40.3
Kansas City	55.73	.35	.59	2.20	6.20	140.00	260.00	.45	1.60	35.9	46.4	46.6		39.9
Los Angeles	68.40	.325†	.585†	2.70†	6.75†	130.50	217.50	1.00	2.00	61.1	50.1	58.6		47.1
Minneapolis	57.47	.305†	.549†	2.196†	6.25†	.....	.....	.90	2.10	64.2	53.2	60.7		49.3
Montreal	67.00	.35e	1.50e	5.25p	8.50ep	45.00m	64.00m	.48m†	1.92m†	....	....	....		....
New Orleans	51.78	.38	.68	1.69	....	150.00	220.00	.45	1.65	62.4	54.4	58.8		50.3
New York	52.40	.308	.594	2.32	6.65	.....	.....	.60	1.40	64.9	53.9	62.4		50.9
Philadelphia	51.00	.335	.675	2.75	7.50	150.00	225.00	.45	1.75	56.6	42.8	53.6		39.1
Pittsburgh	56.00	.266†	.513†	2.295†	5.945	97.80	154.20	.85g	2.00g	68.5i	57.5i	66.0i		54.5
St. Louis	53.62	.28	.504	2.016	4.80	85.00	220.00	1.25j	2.25k	56.4	42.6	52.5		38.6
San Francisco	68.40	.3625d	.6525d	2.61	6.32	115.00	192.50	.58	2.34	45.0	31.0	41.0		28.0
Seattle	70.20	.375	.675	2.70	6.75	115.20	.....	.51f	1.44f	....	....	....		....

‡ Delivered. † F.o.b. a B. & S. class B and heavier, C/L lots, 200 tons and over Burlington, N. J. (base) $49.00. Based on existing freight rates; subject to rate change. Gas pipe and class A, $3 per ton additional, 4 in., $3 per ton additional, 30 in. and larger usually $2 per ton less. b Double strength. c List to dealer. d List. e 30-inch. f Less 5% for cash. g Culvert pipe. h Discounts from standard list consumers carload prices, except Pittsburgh prices are f.o.b. mill. Base price $200 per net ton. List prices per ft.: ¾ in., 8½c.; ¾ in., 11½c.; 1 in., 17c.; 2 in., 37c.; 2½ in., 58½c.; 3 in., 78½c.; 4 in., $1.09; 6 in., $1.92 3 per cent tax on transportation costs not included. i Applies also at Lorain, Ohio, mills. Chicago delivered base is 2½ points less on butt, 1½ on lap. Freight is figured from Pittsburgh, Lorain, O., Chicago Dist. Billing is from producing lowest price at destination. WROUGHT IRON PIPE: Base and list prices per ft. same as wrought steel pipe. Discount for Pittsburgh Butt-weld—1 in. and 1¼ in. black 34, galv. 16; 1½ in. black 38, galv. 18; black 37½, galv. 18. Lapweld—2½ in. to 3½ in. black 31½, galv. 14½; 4 in. 8 in. black, 32½ galv. 17. j Reinforced; spec. C 76–37. k Reinforced; C 75–37. l Plus sales tax. m Tax included. n 27-in. pipe. o Less p Less 53%. r Truck delivery. s Price quotations on delivered basis since 1940; current f.o.b. price $84 for 6 in.; $130 for 8 in. t Reinforced pipe since May, 1937; current plain pipe prices are: 12 in., 36c.; 24 in., $1.30.

here's why the NEW Buckeye Dozer...

sets new high standards of dozing performance

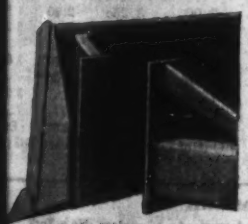

OVERHEAD STRAIGHT-LINE CABLE ACTION MINIMIZES WEAR AND FRICTION LOSSES
BUCKEYE POWER CONTROL UNIT ASSURES SMOOTH, FAST, POWERFUL ACTION
1, 2, 3 OR 4 PART CABLE ARRANGEMENT FOR DIFFERENT SPEEDS
ONE POINT, DIRECT, CENTER LIFT MOLDBOARD SUSPENSION
DOUBLE TRUNNION PERMITS TIPPING OF MOLDBOARD FORWARD FOR HANDLING LARGER LOADS OF LOOSE MATERIAL
SPECIAL MOLDBOARD CURVATURE ROLLS BIGGER LOADS AHEAD
REPLACEABLE CORNER BIT
HEAVY BOXBEAM PUSH ARMS
REVERSIBLE CUTTING EDGE
BALANCED DESIGN KEEPS FULL LENGTH OF CRAWLERS ON THE GROUND
PUSH ARMS CAN BE UNBOLTED FOR EASY SHIPPING
PUSH ARM CLOSE TO CUTTING REACTION
STRONG, RUGGED, REINFORCED MOLDBOARD

RIGID MOLDBOARD

Rear view of bulldozer moldboard shows large, closely spaced, moldboard ribs which assure permanent rigidity.

REINFORCED PUSH PLATE

Rear view reveals large number of heavy, supporting ribs reinforcing push plate for toughest dozing jobs.



DEMOUNTABLE PUSH ARMS

Push arms can be easily unbolted to save shipping space and facilitate handling. Note large bolting areas which provide the rigidity of one-piece unit.

ALL these features are the result of thoroughly engineered design combined with high quality of material and exceptionally rugged construction which enable the new Buckeye cable-controlled dozer to outperform all others. It is strong and rigid enough to take the full power of the tractor on one corner of the moldboard without permanent deflection. Rolling bigger loads, uprooting trees and stumps, digging out boulders, levelling, back-filling, grading in all kinds of ground conditions are everyday jobs for the new Buckeye dozer. There's never more than the minimum of lost time for repairs and maintenance. Here's your postwar bulldozer ready now!

Write for specifications.

THE BUCKEYE [illegible]ON DITCHER CO.

Findlay, Ohio

LUMBER, TIMBER PLYWOOD—PER M FT., B.M., CARLOAD LOTS F.O.B.

	SHORT LEAF YELLOW PINE AND DOUGLAS FIR — All S. L. Y. P. is No. 2 common or better and for No. 1 N. C. Bev. (Prices in Bold Face) — All Fir planks No. 2 common, Fir timber is No. 1 common. Lengths up to 20 ft. (Prices in Italics)									LONG LEAF Y. P. Merchantable grade up to 20 ft.		PLYWOOD Rail freight increment (See note for base price)	
	1x6 [a,g]	1x8 [a,g]	2x4 [a,g]	2x6 [a,g]	2x8 [a,g]	2x10 [a,g]	3x12 [a,h]	6x12 [a,h]	12x12 [a,h]	2x12 [a,h]	12x12 [a,h]	¼"	⅜"
Atlanta	$40.00	$40.00	$32.00	$35.00	$34.00	$37.00	$45.00	.....	.....	$57.00	$64.00	$17.90	$21.85
Baltimore	44.00	46.00	44.00	46.00	47.00	52.00	65.00	.....	.....	115.00	120.00	18.25	22.25
	48.00	*49.00*	*55.00*	*55.00*	*55.00*	*57.50*	*68.00*	*$75.00*	*$75.00*	.....	.....	.....	.....
Birmingham	45.00	45.00	44.50	43.50	44.50	47.50	58.00	55.00	56.00	.....	.....	17.35	21.15
	50.00	50.00	49.50	48.50	49.50	52.50	72.00	.....	.....	67.50	70.00	.....	.....
Boston	60.00[b]	60.00[b]	60.00[b]	60.00[b]	60.00[b]	62.00[b]	66.00[b]	.....	.....	58.00[m]	58.00	18.25	22.25
	55.00	*55.00*	*54.00*	*54.00*	*54.00*	*54.00*	*58.00*	*58.00*	*58.00*	.....	.....	.....	.....
Chicago	54.00	54.00	55.00	54.00	54.00	60.00	65.00	.....	.....	80.00[l]	95.00[l]	14.60	17.80
	55.00	*55.00*	*54.00*	*54.00*	*54.00*	*55.00*	*56.00*	*56.00*	*57.00*	.....	.....	.....	.....
Cincinnati	47.50	49.00	42.50	42.50	42.50	44.50	67.00	.....	.....	65.00	65.00	17.35	21.15
	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cleveland	42.50[k]	42.50[k]	52.50[k]	51.00[k]	45.00	45.00	53.00	53.00	53.00	.....	.....	17.75	21.60
Dallas	45.25	45.25	44.50	43.00	43.00	47.25	60.75	58.75	58.75	88.75	85.00	14.60	17.80
Denver	63.50[a]	62.00[a]	65.00[a]	65.00[a]	65.00[a]	66.00[a]	69.00[a]	*85.00*	*89.00*	.....	.....	10.45	12.70
Detroit	61.00	61.00	57.75	57.75	57.75	63.75	71.00	70.75	90.00	70.75	90.00	17.35	21.15
	57.00	*57.00*	*57.00*	*57.00*	*62.75*	*72.75*	*75.00*	*75.00*	*90.00*	.....	.....	.....	.....
Kansas City	69.00	69.00	67.00	66.50	67.00	69.00	84.00	.....	.....	84.00	94.00	12.60	15.40
	66.00	*66.00*	*59.50*	*59.50*	*59.50*	*59.50*	*78.00*	*80.00*	*80.00*	.....	.....	.....	.....
Los Angeles	*60.00*	*60.00*	*60.50*	*60.75*	*59.25*	*59.25*	*78.75*	*78.00*	*78.00*	.....	.....	9.90[ph]	12.05[ph]
Minneapolis	59.00[a]	59.00[a]	.....	.....	.....	.....	.....	.....	.....	.....	.....	12.60	15.40
	56.50	*64.75*	*57.00*	*57.25*	*58.25*	*57.00*	*61.50*	*59.75*	*59.75*	.....	.....	.....	.....
Montreal	*58.00*	*61.00*	*54.00*	*58.00*	*60.00*	*60.00*	.....	.....	.....	200.00	200.00	.....	.....
	54.00	*54.00*	*57.00*	*57.00*	*57.00*	*58.75*	*62.00*	*62.00*	*62.00*	.....	.....	.....	.....
New Orleans	40.00	40.00	37.00	35.00	34.00	36.00	46.00	.....	.....	55.00	60.00	14.60	17.80
	31.00	*31.00*	*33.00*	*31.00*	*34.00*	*33.00*	*53.00*	.....	.....	.....	.....	.....	.....
New York	67.50	67.50	62.50	62.50	62.50	64.00	74.00	.....	.....	120.00[f]	125.00[f]	18.35	22.25
	.....	.....	*65.00[i]*	*65.00[i]*	*65.00[i]*	*65.00[i]*	[Ranges from $75 to $95]			.....	.....	.....	.....
Philadelphia	75.00	75.00	75.00	75.00	75.00	75.00	75.00	.....	.....	130.00	130.00	18.25	22.25
	75.00	*75.00*	*75.00*	*75.00*	*75.00*	*75.00*	*85.00*	*90.00*	*90.00*	.....	.....	.....	.....
Pittsburgh	50.80	53.20	62.75	55.00	60.85	62.50	76.25	.....	.....	.....	.....	18.10	22.05
	69.20	*68.10*	*66.10*	*65.80*	*65.65*	*65.65*	*88.75*	*88.75*	*88.75*	.....	.....	.....	.....
St. Louis	60.00	60.00	56.00	55.00	56.00	57.00	69.00	*75.00*	*75.00*	87.00	87.00	14.60	17.80
San Francisco	*41.00*	*41.00*	*36.50*	*36.75*	*35.75*	*35.75*	*37.50*	*36.00*	*36.00*	.....	.....	7.30[g]	8.90[g]
Seattle	*35.00*	*35.00*	*35.00*	*35.00*	*35.00*	*35.00*	*40.00*	*40.00*	*40.00*	.....	.....	0.00	0.00

Bold Face type, Southern Pine. *Italics, Douglas Fir.* [1] Long leaf. [2] Roofers, N. C. Pine. [3] Spruce. [4] Native. [5] Western Pine, No. 3 Common. [7] Spruce. [8] Norway Pine. ‡ Delivered. *a* Yard prices. *b* Contractors discount in Minneapolis and St. Paul discontinued May 21, 1938. *c* 5M ft. or less. *d* F.o.b. cars San Francisco freight rate. *e* 10% discount taken off. *f* Up to 18 ft. † Plus sales tax.

Note: Special concrete form grade Fir Plywood, 4' by 8' panels, 5-ply, sand 2 sides, water resistant glue, carload lots, delivered per 1,000 sq. ft. surfa Seattle base price on ¼", $95.15; on ⅜", $104.85; price includes oiling and w ing charges. For other centers add rail freight increment from table or pro size. For resin dipped treatment, add $10.50 per M. *g* Lower rate by wa shipment. *h* 50,000 lb. minimum. *i* Ranges from $65 to $69. *j* Average pr *k* August 1943 price. *l* September price; none later available.

GLASS, EXPLOSIVES, CHEMICALS

	WINDOW GLASS — Discounts from jobbers list, Aug. 15, 1938 — Single or Double Thickness		EXPLOSIVES — Per lb. 40% Ammonia Gelatin in 50-lb. cases delivered in 200 lb. lots*
	A quality	B quality	
Atlanta	73%	75%	$0.15
Baltimore	78%	79%	.15
Birmingham	76%	76%	.105
Boston	77%	78%	.15
Chicago	77%	77%	.15
Cincinnati	77–10%	77–10%	.15
Cleveland	77%	77%	.19
Dallas	76%	76%	.1625
Denver	76%	76%	.155*e*
Detroit	77%	77%	.1375
Kansas City	77–10%	77–10%	.155
Los Angeles	86%*d*	88%*d*	.1575
Minneapolis	77%	77%	.155
Montreal	40–5%*ab*	47%*ac*	.1675†
New Orleans	70%	75%	.16
New York	81%	82%	.22*f*
Philadelphia	78%	79%	.15
Pittsburgh	79%	79%	.1225
St. Louis	77–10%	77–10%	.155
San Francisco	66%	73%	.155
Seattle	75%	75%	.1575†

Price of 60% Ammonia Gelatin is $0.01 per lb. higher than 40%

a Discount from list Sept. 1939; sales tax included, but 6% tax exemption not allowed for. *b* Single thickness. *c* Double thickness. *d* Discount from jobbers' list Sept. 15, 1928.

* Urban prices influenced by service charges or local storage and delivery regulations, do not consistently reflect quantity prices in less congested areas. *e* F.o.b. Louviers, Colo. *f* In boroughs of Kings, Queens and Richmond, and in Manhattan south of Canal St. add delivery charge of $5.00 per trip. † F.o.b.

40% Ammonia Gelatin price ranges in other than urban areas, per lb. (except Seismograph Grades)

	C/L 20,000 lb. net	Tons	200 lb. lots
E. of the Miss., except Fla. and Me.	$0.105	$0.13	$0.15
W. of Miss. to Rocky Mtn. States, Fla. and Maine	.11 –.1175	.135 –.1475	.155 –.1675
Rocky Mtn. States	.11 –.1225	.135 –.1525‡	.155 –.1725‡
Pacific N. W. States	.1075–.12	.1375–.15	.1575–.17
Pacific S. W. States	.1050–.1125	.135–.1425	.155–.1625

‡ F.o.b. Louviers, Colo., or Butte, Mont.

PILES, TIES—F.O.B.

PILES

Prices per linear foot, fir and pine, bark on, f.o.b. cars, New York. Fir ba on Wash. and Ore. points to New York shipping area; pine based on freight ra Norfolk.

Dimensions	Points	Length	By Rail — Pine*	Fir
12-in. at butt	6-in.	30 to 50-ft.	$0.34	....
12 in.— 2 ft. from butt	6-in.	50 to 59-ft.	.35	....
12-in.—2-ft. from butt	6-in.	60 to 69-ft.	.36	....
12-in.—2-ft. from butt	6-in.	90 to 100-ft.	....	....
13-in.— 3-ft. from butt	5-in.	91 to 100-ft.	....	....
14-in.— 2-ft. from butt	6-in.	50 to 69-ft.	.41	....
14-in.— 2-ft. from butt	6-in.	70 to 79-ft.	.43	....
14-in.— 2-ft. from butt	5-in.	80 to 85-ft.	.53	....
14-in.— 2-ft. from butt	5-in.	85 to 89-ft.	.56	....
14-in.— 2-ft. from butt	5-in.	90 to 100-ft.	....	....

* Pine piling over 80-ft. available only in limited quantities.

RAILWAY TIES

Prices f.o.b., per tie for carload lots:		6"x8"x8' Untr.	6"x8"x8' Tr.	7"x9"x8'6" Untr.	7"x9"x8'6" Tr.
Boston	Oak	$1.50	....	$2.00	....
	Pine	2.00	$3.00*a*	2.50	$3.00*a*
New York	S. L. Sap Pine	1.43/1.54	2.59	1.76	2.86
	Mixed Oak	1.71	2.59	2.42	3.35
Birmingham	White Oak	1.00	1.60*a*	....	2.25*a*
Chicago	Red Oak	....	2.00/2.25*a*	....	2.87/3.00*a*
Los Angeles	Douglas Fir	2.00	3.25*a*	2.90	4.70*a*
Philadelphia	Red Oak	....	2.10*ag*	....	3.25*a*
St. Louis	White Oak	1.63	....	2.19	....
	Red Oak	1.63	2.20*a*	2.19	3.00*a*
	Sap Pine or Cypress	1.70	....	2.06	....
San Francisco	Douglas Fir	1.25*b*/	....	....	3.00*a*
Montreal	Birch or Maple	.85	.95	....†	....

Tr.— Treated; Untr.— Untreated. *a* Creosoted. *b* 6"x8"x8'6". *c* Ba cell. *d* Zinc. *e* Green. *f* F.o.b. cars. † Out of market. *g* January 1943 p none later available.

CHEMICALS

Water, sewage treatment, road work, f.o.b. carlots, New York

Bleaching powder, in drums, f.o.b. works, per 100-lb.	$2.50–3.
Chlorine cylinders, liquid, per lb., delivered	.6
Calcium chloride, 77–80%, flaked, 100-lb. paper bag, del'd, ton	18.50–55.
Silicate of soda, 52 deg. in drums, f.o.b. works, per 100 lb.	1.
Soda ash, 58%, in paper bags, per 100 lb. dense	1.
Sulphate of aluminum, commercial, in 100-lb. bags, per ton	23.00–25.
Sulphate of copper, in bbl., per 100-lb.	5.

The kind of aluminum pigment you buy makes a vast difference in how well a bridge or highway guardrail can be seen at night. High purity pigment means high reflectivity of headlights. Low purity pigment, low reflectivity.

Actually, it takes but slight impurity to make a considerable difference in light reflection. Pigment made from 99+% pure aluminum gives the paint a high reflection value of 70% or more. Reduce the aluminum content only 2% and the reflection value is reduced by 10%.

Aluminum pigment produced from low grade metal may contain as much as 10% impurities. Paint made with such pigment would have less than 50% reflectivity and would have little, if any, metallic lustre. Would look dull, unattractive.

Other tests have proved that durability also is affected by metallic impurities. Low purity aluminum pigment gives far less protection to weather-exposed steel. Rust appears soon.

All these facts point up the importance of knowing the metallic purity of the pigment you get. For night driving safety, for beauty, for durability, specify pigment made from 99+% pure aluminum . . . Alcoa Albron Pigment. ALUMINUM COMPANY OF AMERICA, 1812 Gulf Building, Pittsburgh 19, Pennsylvania.

7 ADVANTAGES OF ALUMINUM PAINT

- High durability
- High reflectivity
- High hiding power
- Resistance to moisture
- Resistance to fumes
- Resistance to heat
- Attractive appearance

ALCOA

MADE UNDER PATENTS OF METALS DISINTEGRATING COMPANY, INC.

STRUCTURAL CLAY BUILDING TILE, BRICK AND LIME—DELIVERED

	STRUCTURAL CLAY TILE—PARTITION—SCORED Per M. lots of 2,000 pieces or over, 3x12x12 in.	4x12x12 in.	8x12x12 in.	STRUCTURAL CLAY TILE—LOAD BEARING—SCORED Per M. lots of 2,000 pieces or over, 8x12x12 in.	10x12x12 in.	12x12x12 in.	BRICK Per M. in quantity, Common backing	Straight hard	LIME Per ton, Hydrated finishing	In paper, Common hydrated	Carload lots, Pulverized or lump
Atlanta	$104.00	$114.00	$190.00	$234.00	$244.00	$250.00	$15.00	$18.04	$26.54	$17.04	$15.04
Baltimore	84.00	90.00	170.00	200.00	260.00	300.00	16.00*b*	20.00*b*	18.00	13.00	2.30
Birmingham	80.00	85.00	160.00	191.00	252.00	288.00	14.50	17.00	18.11	13.64	2.25
Boston	103.75*a*	110.65*a*	207.45*a*	248.90	.....	.....	20.00*i*	20.00*i*	21.00†	.....	16.00
Chicago	72.00	77.00	145.00	197.00	243.00	278.00	12.50	13.50	17.00	15.00	12.50
Cincinnati	65.55	69.90	131.20	148.70	210.35	240.45	22.00	22.00	15.50	13.00	.....
Cleveland	62.75	66.95	125.50	150.00	201.90	231.15	20.00	20.00	15.75*j*	13.25*j*	3.50
Dallas	62.50	67.50	135.00	162.00	212.50	263.00	13.50*i*	15.00*i*	19.00	15.00	15.00
Denver	84.80	95.40	153.70	178.20	212.00	227.90	14.50	18.00	25.00*j*	17.00*j*	20.00
Detroit	92.70	98.70	181.20	206.75	267.50	306.00	20.75	20.75	18.00	16.00	16.00
Kansas City	67.00	69.00	89.00*c*	128.00	163.00	189.00	14.50	16.50	19.32	13.00	10.92
Los Angeles	73.50†*r*	89.50†*r*	128.00*c*†*r*	210.00†*r*	368.00†*r*	460.00†*r*	13.50	15.00	16.50	17.50	17.00
Minneapolis *x*	81.00*b*	86.40*b*	159.20*b*	.....	177.00*b*	246.00*b*	13.00†	23.00*g*	21.00	16.00	19.00
Montreal	94.55*a*	100.45*a*	199.50*a*	160.45*a*	109.40*at*	137.40*av*	21.08†*u*	28.35†*u*	24.60*u*	18.00*u*	.....
New Orleans	72.00	72.00	135.00	162.00	210.00	260.00	14.00	.....	18.30	12.08	14.70
New York	78.40	83.60	115.00*c*	193.30*h*	238.80*h*	295.60*h*	17.50/18.50	.....	20.00	14.00	17.00
Philadelphia	85.30	91.00	170.50	204.60	252.00	312.00	17.00	20.00	19.00	16.00	15.00
Pittsburgh	72.85	78.55	147.25	163.75	217.50	231.00	20.50	22.50	17.90	15.40	2.55
St. Louis	67.00	95.00	130.00	190.00	244.00	290.00†	18.00	17.00	22.00	18.00	2.50
San Francisco	96.00	108.00	144.00	108.00*z*	.....	.....	21.50	.....	24.00	23.00	2.30
Seattle	115.00	125.00	230.00	.....	.....	.....	20.50*f*	24.00*f*	20.00*s*	20.00*s*	20.00

† F.o.b. *a* Smooth. *b* Carload lots delivered to job. *c* 6x12x12 in. *d* Not load bearing. *e* 48 lb. tile. *f* Less $1.00, ½ cash 15 days, balance 30 days *g* Selected common. *h* F.o.b. Perth Amboy, N. J. *i* F.o.b. Warehouse only. *j* LCL. *k* $1.00 discount if paid in 10 days. *l* Lump. *m* Per bbl., 180 lb. *o* Per bbl., 200 lb. *p* 280 lb. bar. *r* 5% discount 10 days. *s* 2% discount cash. *t* 5½x5x12. *u* 8% sales tax included. *v* 6x12x12-in. *w* Per 220 lb. *x* Sept. 1944 prices, Oct. not available on tile.

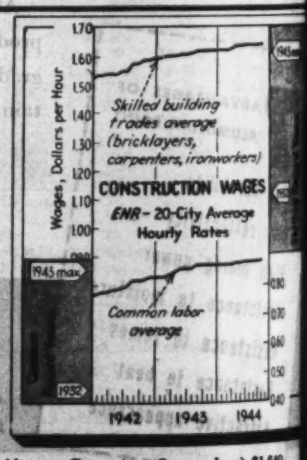
PAINT, ROOFING—F.O.B. CARLOAD LOTS

	RED LEAD Per 100 lb. in 600-lb. (Approx.) bbl. Dry *a*	WHITE LEAD Per 100 lb in oil	READY-MIXED PAINT Per gal., drums Graphite *b*	Aluminum *b*	Ferric Oxide *d*	ROOFING SUPPLIES Carload lots f.o.b. factory Rolls, slate surfaced, 85-90 lb per sq.	Asphalt felt, per 100 lb.	Tar felt, per 100 lb.	Asphalt coating per gal.	Tar pitch, 330 lb. bbl. per ton
Atlanta	$10.25	$14.125	$1.30	$2.25	$1.20	$1.90	$1.61	$1.61	$0.27	$39.00
Baltimore	10.00	13.75	2.00	3.00	2.50	2.30	2.70	2.70	.40	29.00
Birmingham	10.25	14.125	2.35	3.50*r*	1.98*r*	2.04	1.97	1.97	.32	28.00
Boston	10.00	13.75	1.75	2.50	2.31	2.00‡*h*	3.30‡*w*	3.30‡*w*	.25‡	21.00
Chicago	10.00	13.75	....	....	....	1.75*h*/*f*	1.74*h*/*f*	1.82*h*/*f*	.33/*f*	23.00
Cincinnati	10.00	13.75	1.70	2.90	1.60	2.20	2.10*h*	2.10*h*	.33	25.00
Cleveland	10.00	13.75	1.70	2.90	1.60	1.93	1.83*h*	1.83*h*	.25	27.00
Dallas	10.00	14.50	1.88	2.11*n*	.05*l*	1.75*h*	1.66*h*	1.66*h*	.35	39.00
Denver	10.50	14.25	....	....	.27*l*	2.45	2.95	2.95	.35	28.00
Detroit	10.00	13.75	1.75	3.00	1.60	2.25	2.25	2.25	.50	23.00
Kansas City	10.00	13.875	2.30*g*	2.55*r*	2.16*g*	2.10	2.30	2.30	.28	27.50
Los Angeles	10.25	14.25	1.60	2.25	2.30	2.10	1.50	....	.45	.....
Minneapolis	10.00	13.875	....	....	....	1.80*j*/*h*	1.7098*h*/*i*	1.7098*h*/*i*	.32	23.00
Montreal	9.25	6.25	2.50*p*	4.90*p*	3.15*p*	4.02*t*	2.58*t*	3.01*t*	.89*t*	2.10
New York	10.00	13.75	2.03	....*r*	1.82	1.7098	1.6273*h*	1.6273*h*	.26	25.00
Philadelphia	10.00	13.75	1.60/1.80	2.20*r*	1.55	1.75	1.66	1.66	.32	23.00
Pittsburgh	10.00	13.75	1.05	1.95	.80	1.95	1.84*h*	1.84*h*	.34	26.00
St. Louis	10.00	13.75	2.28*s*	2.89*s*	1.96*s*	1.70	1.70	1.70	.37	24.00
San Francisco	10.25	14.00	1.80	2.75*n*	1.35	1.71	2.40	2.40	.33	20.50
Seattle	10.25	14.25	1.90	3.00	....	2.15	2.16*h*	....	.35	26.50

‡ Delivered. Note: Red lead in oil 50c. higher than white lead in oil. *a* Red lead prices change frequently due to pig lead price changes. *b* U. S. War Dept. Spec. 3-49A. *c* ASTM Spec. D266-31. *d* 80% minimum ferric oxide. *e* Subject to 25% discount. *f* Distributors' price to contractors. *g* 5 gal. can. *h* Per roll, 65 lb. *i* Minneapolis and vicinity. *j* Asphalt pitch. *k* Per ton. *l* Per lb. *m* Per bbl. *n* May, 1941 price, no later quotation available. *p* 8% sales tax. *r* Not available, except on priority rating; then quoted specially. *s* December, 1942 price. *t* Federal tax included. *u* 90-lb. roll. *v* Truck delivered.

SKILLED AND COMMON WAGE RATES—PER HOUR

	Bricklayers	Carpenters	Struct. Iron Workers	Hoisting Engineers	Plasterers	Common Labor—Building	Common Labor—Heavy Const.
Atlanta	$1.50	$1.25	$1.50	$1.25	$1.50	$0.40	$0.50
Baltimore	1.75	1.4375	1.80	1.625/2.00	1.50	.75	.75
Birmingham	1.75	1.25	1.50	1.25/1.50	1.50	.65	.65
Boston	1.625	1.50	1.65	1.50/1.875	1.667	1.00	1.00
Chicago	1.75	1.70	1.76	1.75	1.825	1.10	1.10
Cincinnati	1.875	1.50	1.675	1.45/1.60	1.625	.85	.85
Cleveland	1.875*c*	1.575	1.875	1.875	1.875	1.085	1.15/1.25
Dallas	1.625	1.25	1.50	1.75	1.625	.60	.75/1.25
Denver	1.65*b*	1.50*b*	1.50*b*	1.50/1.625*b*	1.50*b*/*f*	.80*b*	.80*b*
Detroit	1.725	1.50	1.75	1.675/1.75	1.725	.90/100	.90
Kansas City	1.65	1.50	1.625	1.625	1.65	.90	.90
Los Angeles	1.50	1.35	1.625	1.375	1.667	.875	.875
Minneapolis	1.625	1.44	1.625	1.50	1.625*e*	.95	.95
New Orleans	1.50	1.25	1.50	1.50	1.375	.65	.75
New York	2.00*b*	1.85*b*	2.00	2.00*b*	2.00*b*	1.10/*f*	.95
Philadelphia	2.00	1.58	2.00	2.00	2.00	.825	.825
Pittsburgh	1.90	1.75	1.75	1.8125	1.875	.90	.80
St. Louis	1.75	1.50	1.75	2.00	1.75	1.00	1.00
San Francisco	1.875	1.50	1.75	1.50/1.75	1.75	1.00	1.00
Seattle	1.845	1.565	1.745	2.00	1.865	1.145	1.10
Montreal*	1.05	.95	1.00	.90	1.05	.60	.65



§ 7 hr. day. *e* Prevailing rate on government work. *s* 35 hr. wk.
* Cost of living bonus now included in basic wage.

ENR Skilled Average: (Bricklayers, Carpenters, Ironworkers) $1.640.
ENR Common Average: $0.886.

BLUEPRINT Now!

WATERWORKS

For Better Public Health—a Better Post-War Living Standard!

DISPOSAL PLANTS

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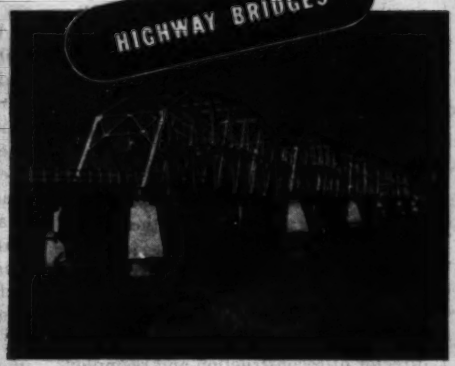
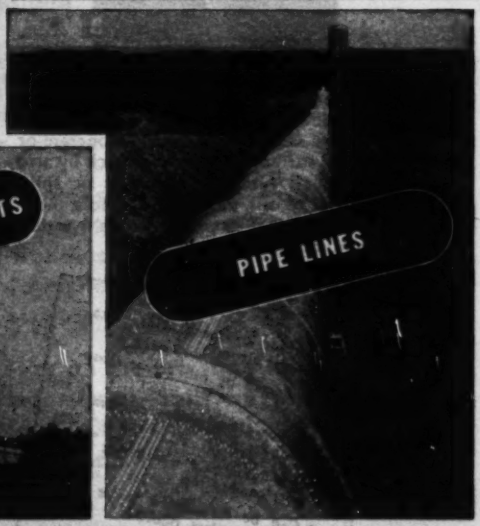
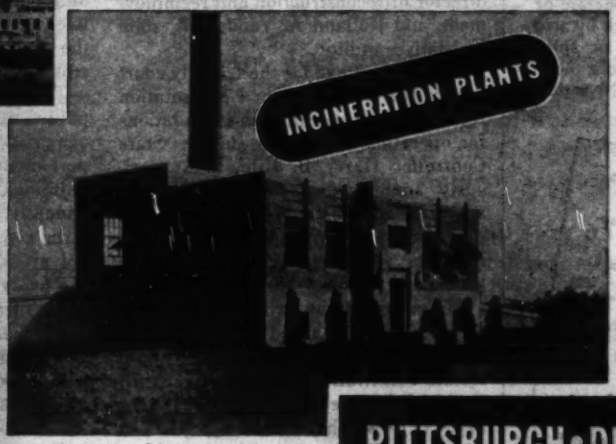
HIGHWAY BRIDGES





PIPE LINES

INCINERATION PLANTS



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ng your contributions toward building a America after the war, use the specific e of this experienced organization—at every stage from design to completed —of obvious value in blueprinting now!

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DES MOINES, IOWA, 915 TUTTLE STREET

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CHICAGO . . 1218 FIRST NATIONAL BANK BUILDING
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SAN FRANCISCO . . . . . 621 RIALTO BUILDING
SEATTLE . . . . . 1122 EIGHTH AVENUE, SOUTH

Tygon Paint, a liquid form of sheet Tygon, the chemically inert, rubber-like plastic used to line acid tanks, is an effective safeguard for metal, concrete or wood surfaces exposed to attack by acid or alkali fumes, condensates or spillage, or to oils, gasolines, alcohols, moisture, salt air or other tough weather conditions.

Send for FREE SAMPLE

★ Resistant to most acids, alkalies, and alcohols
★ Unaffected by oil, grease, gasoline, fresh or salt water
★ Non-oxidizing—does not crack, chip, craze or "weather"
★ Non-flammable — will not support combustion
★ Can be formulated to be non-toxic, tasteless, odorless
★ May be air-dried or baked
★ Available in white, black, clear, gray, green, red, and aluminum

U. S. STONEWARE
Since 1865 • Akron, Ohio

NEWS OF THE WEEK

(Continued from page 59)

Constitutionality test on California works act

Seeking early removal of potential legal barriers to the state's right to extend subsidies to local governments requiring financial assistance for the development of postwar construction programs, California state officials recently paved the way for a supreme court constitutionality test of its recently enacted $10,000,000 public works appropriation act.

The act was passed at the June special session of the legislature and became effective as of Sept. 12. It undertakes to extend $6,875,000 to municipalities and counties for preparing plans for postwar projects, and $3,000,000 for the purchase of sites and rights-of-way. Remainder of the fund would be used by the state to defray administrative costs.

Plans for the court test were formulated at the initial meeting in Sacramento of the newly appointed State Postwar Public Works Board, headed by State Finance Director James S. Dean, who a month ago advised California municipalities and counties they could start filing their applications for state funds. (*ENR*, Aug. 24, vol. p. 208). Other members of the board are Charles H. Purcell, state director of public works; Col. Alexander R. Heron, state director of reconstruction and reemployment, and Rolland A. Vandegrift, state legislative auditor.

Setting the stage for the friendly court action, the Board adopted a resolution refusing to set up rules and regulations for operation of the new statute. State Controller Harry B. Riley had previously announced he would refuse to authorize any of the $10,000,000 in proposed subsidies until the supreme court rules on whether the act violates the state constitution.

Major questions which the state's high court will be asked to settle are (1) whether the projected program would violate constitutional provisions against the gift of money from the state treasury, (2) whether the appropriation meets the requirement that it be for a single purpose, (3) whether the division of the allotments amounts to two items of appropriation by the legislature in a single bill and (4) whether the measure was within the scope of Gov. Earl Warren's call for a special legislative session.

Several state attorneys have expressed the opinion it may become necessary the state to establish it has a direct terest in the proposed local projects fore it can legally give money to local governments.

• • •

Repair and maintenanc over $4 billion yearly

Expenditures for repairs and m tenance of existing construction amount to nearly $25,000,000,000 ing the first six years after the war, improvements to public utility syst and highways accounting for nearly the total, according to a recent f cast by the Producers' Council, nati organization of manufacturers of bu ing materials and equipment.

As compared with an estimated 000,000,000 being spent for repair maintenance, both public and pri during 1944, the expenditures for types of improvements are expecte rise to $4,000,000,000 during the twelve months after the war and reach an average of $5,000,000,000 nually during the next five years, cording to Russell G. Creviston, ch man of the Council's postwar comm Reflecting the small amount of non-military construction permitted ing the war period, the postwar vo of repair and maintenance is expe to exceed all previous records, inclu the peacetime peak of $3,600,000 reached in 1929.

The council's forecast estimates public utility improvements will age about $1,500,000,000 in the period after the war. Repairs to buildings are estimated at $725,000 annually, exceeding the value of farm construction which probably not average above $585,000,000 d the five years.

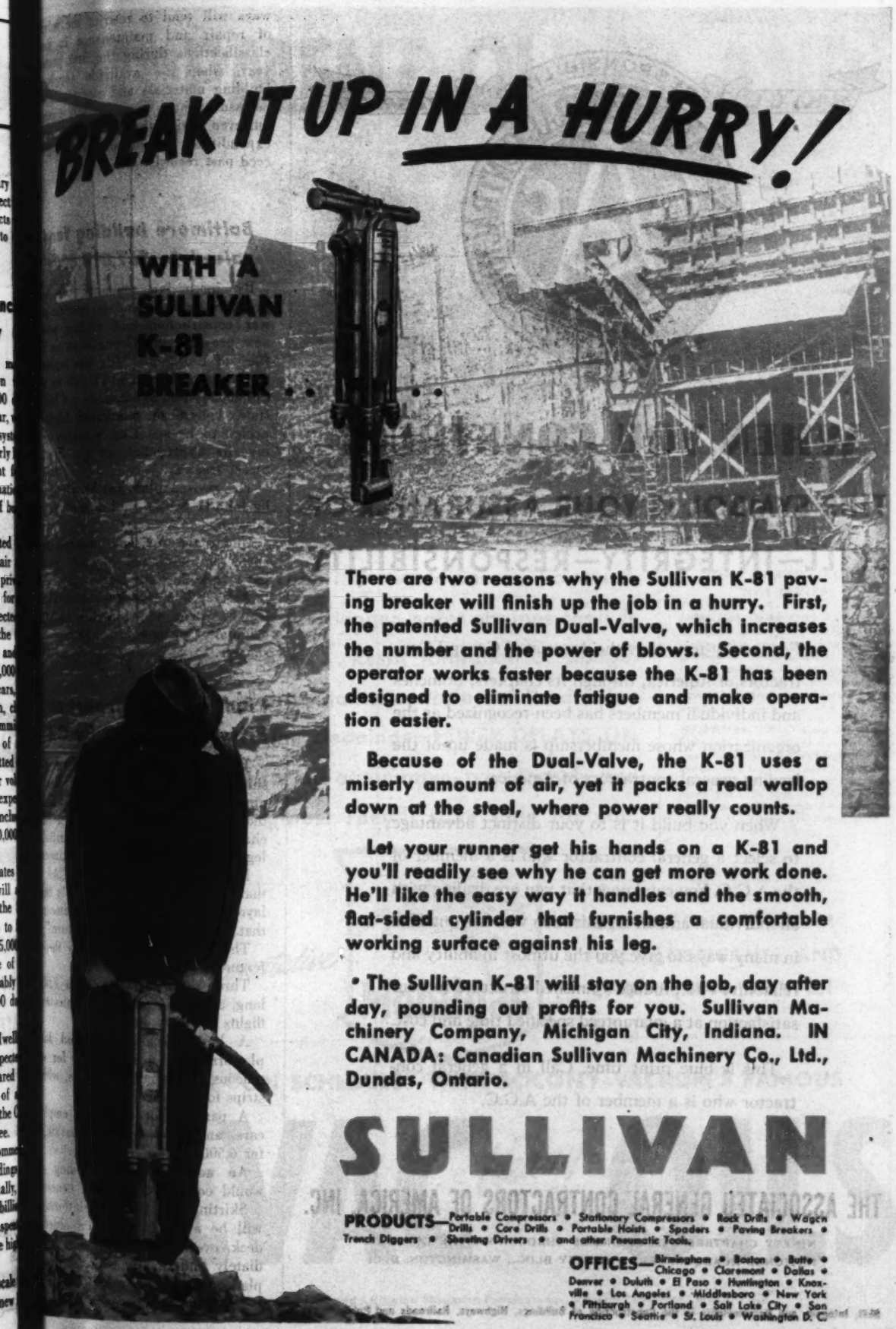
Maintenance and repair of dwell other than farm homes, is expecte average $1,100,000,000, compared new residential construction of $6,500,000,000, as forecast by the C cil's market analysis committee.

Repairs to industrial and comme properties and to public buildings aggregate $600 million annually, public works in excess of one billi which $860 million will be spen repairs and maintenance of the hig system.

It is believed that large-scale struction of new homes and new

BREAK IT UP IN A HURRY!

WITH A SULLIVAN K-81 BREAKER . . .



There are two reasons why the Sullivan K-81 paving breaker will finish up the job in a hurry. First, the patented Sullivan Dual-Valve, which increases the number and the power of blows. Second, the operator works faster because the K-81 has been designed to eliminate fatigue and make operation easier.

Because of the Dual-Valve, the K-81 uses a miserly amount of air, yet it packs a real wallop down at the steel, where power really counts.

Let your runner get his hands on a K-81 and you'll readily see why he can get more work done. He'll like the easy way it handles and the smooth, flat-sided cylinder that furnishes a comfortable working surface against his leg.

• The Sullivan K-81 will stay on the job, day after day, pounding out profits for you. Sullivan Machinery Company, Michigan City, Indiana. IN CANADA: Canadian Sullivan Machinery Co., Ltd., Dundas, Ontario.

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PRODUCTS—Portable Compressors • Stationary Compressors • Rock Drills • Wagon Drills • Core Drills • Portable Hoists • Spaders • Paving Breakers • Trench Diggers • Sheeting Drivers • and other Pneumatic Tools.

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WHEN YOU CONSTRUCT

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NINETY CHAPTERS AND BRANCHES THROUGHOUT THE COUNTRY
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Skill, Integrity and Responsibility in the Construction of Buildings, Highways, Railroads and Public Works

ways will tend to restrict the volu
of repair and maintenance in th
classifications during the first post
year, when the available supply
building materials and equipment w
be insufficient to meet the full dema
but even during that critical year, to
expenditures for improvements will e
ceed past records.

• • •

Baltimore building fund raised to $67,014,800

By increasing amounts previous
proposed to be spent on specific po
war construction and adding seve
new projects, the Commission on C
Plan of Baltimore, Md., has increas
its program from $52,436,600 to $6
014,800. These amounts do not inclu
state, federal or municipal funds
pected to be spent on a harbor cro
ing, its approaches, or the Frank
Street freeway.

The revised plan has been approv
by John D. Steele, chairman of the co
mission.

Under the revision, amounts to
spent on municipal highway proje
have been increased from $17,299,6
to $19,722,100. Approximately $1,50
000 has been added to the $3,000,0
originally proposed to be spent
schools.

• • •

Plan for new airport at Pittsburgh OK'd by CAA

The master plan of the Moon To
ship airport at Pittsburgh, Pa., has b
approved by the Civil Aeronautics A
thority in Washington, with mi
changes, reports Park H. Martin,
legheny County planning engineer.

Martin reported that the CAA s
that the master plan offered "a flex
layout that should meet any emerge
that might come up in the future."

The master plan presents these
features:

Three dual runways, each 7,000
long, and one runway for trans-oce
flights 10,000 ft. long.

A horseshoe-shaped paved loa
platform over a mile long for si
taneous loading of 31 planes, with
strips for easy access.

A parking lot for 3,000 employ
cars, and two additional parking
for 6,500 visitors' cars.

An administration building w
would contain offices and concess

Skirting the loading platform
will be a 1,400-ft. curved observa
deck, overlooking the field, and i
diately underneath a private deck
plane passengers.

Space for hangars for both co

EQUIPMENT OLDER AND NO TIME FOR BREAKDOWNS

THAT YOUR PROBLEM? Then investigate Socony-Vacuum's lvac Oils. They give you far cleaner, safer engines than is ssible with older-type oils . . . Resist formation of sludge, arnish," "lacquer"... guard against corrosion of hard-alloy arings. Mean fewer engine cleanings—FEWER DELAYS ON E JOB! Recommended for all automotive-type Diesels and avy-duty gasoline engines! They'll save time for you.

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MOBILUBE GEAR OILS—Made specially for heavy-duty service, these highly stable, straight mineral gear oils are free of abrasives, soaps, fillers, all foreign material. Will not thicken excessively when cold. Safeguard gears against "scuffing"—wear—costly breakdowns.

MOBILUBE "V"—A special, short-fiber, soda soap grease developed for year-round use in wheel bearings and grease-type universal joints. Also recommended for protection of clutch release bearings and other automotive parts operating at high temperatures. Unusually efficient and long-lasting!

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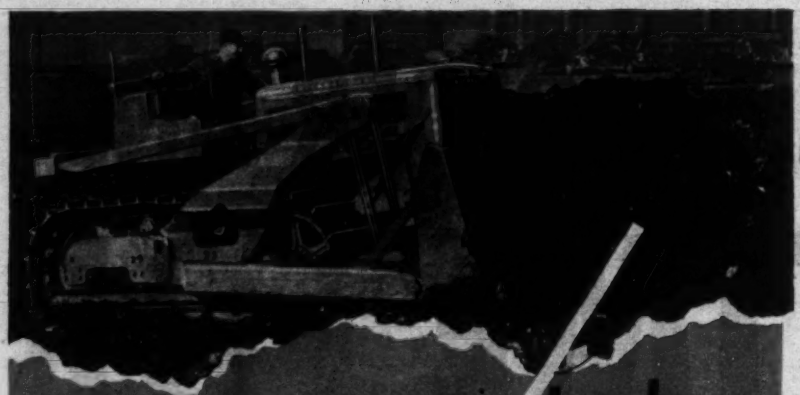

You Get Bigger loads and more profits with HEIL Cable Dozers

Heil Hi-Speed Cable Scoops give you extra speed on long hauls . . .

This big 15-yard tractor scoop is push loaded in 40 to 50 seconds — and hauls at travel speeds up to 20 miles per hour. The tilting floor gives positive mechanical push-out from the bowl and spreads load evenly. It's one of Heil's "bigger yardage at less cost" units that you will need in your post-war business. *Write for bulletins.*

. . . The full power of your tractor drives on the blade to move more "pay dirt"

Here is a rugged unit that is easily adjusted for an extra deep bite — whether in soft dirt or hard-packed clay — to give you a heaping load. And it's just as easy to adjust this unit for side-casting to right or left — to peel a bank — to grade or ditch — or to push straight ahead. Heil Cable Dozers have the quality features that experienced operators demand: Full vision ahead — fast, positive cable control with little effort—smooth action that is easy on the tractor—and less time out for adjustments and repairs. These famous Heil features add up to "big loads" at less cost — and more profit for you.

Write for bulletins.

B-37

SEE YOUR INTERNATIONAL TRACTRACTOR DEALER

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cial and private planes, an expr building, mail buildings, taxi strips, f house, gas storage building, commerc garage, and space for helicopter la ings.

The Army has installed field a landing lights and has started grad for buildings for the ferry comma which plans to operate there this fall.

New one-way, high-speed roads w cut driving time to downtown Pi burgh to 25 minutes.

The actual designing of the build will start at once, so that construct can be started immediately after t war. The airport committee consists Allegheny County Works Director Jo B. Sweeney; Aviation Director Tw Brooks; and Planning Engineer Pa H. Martin.

. . .

Mexican hospital progra to be started soon

The Mexican federal governme will spend in the very near futu $3,000,000 for the construction of small but modern hospitals, accordi to Dr. Gustavo Baz, secretary of t Mexican federal health departme The hospitals will be built at M clova, Saltillo, Tapachula, Chihuah Parral, Leon, Acapulco, Tulacin Guadalajara, Yahualiza, Tepic, Pueb Teziutlan, Hermosillo, Nuevo Lar Tampico, Tlaxcala and Mazatlan.

The department of public works, which Gen. Maximino Avila Camac is director, is cooperating with the f eral health department and the stat

. . .

Army structural steel workers school set up

A new training unit called a str tural steel workers school has b formed at the Army Service For Training Center, Camp Claiborne, L Its purpose is to provide field traini for selected members of Engineer u to build, reconstruct and reinforce st bridges, steel hangars, or other st structures used by tactical milita units.

Capt. R. L. Hubach, head of t school, will serve as its chief of secti His assistant, Capt. M. F. Bartnett, supervise all instruction in structu steel layout and erection. Working rectly under him will be an instructo the hoisting and rigging of steel.

Other members of the staff wil clude an instructor in shop fabrica —blueprint reading and marking steel sections for cutting—and a structor in cutting and welding, a a riveting instructor.

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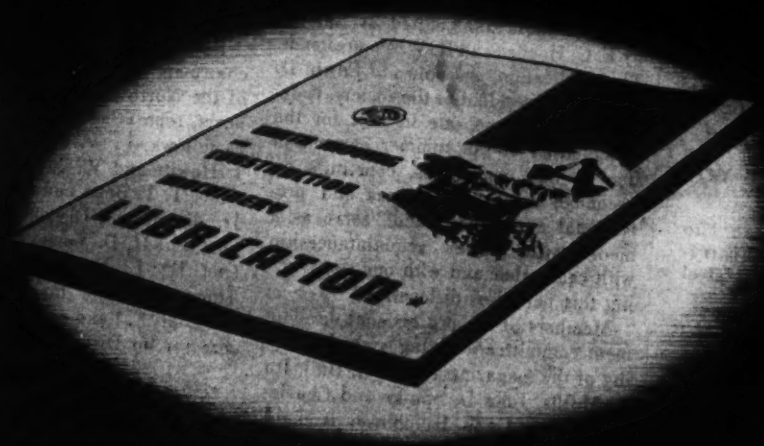

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Civil engineer heads Canadian air board

R. A. C. Henry, prominent Canadian civil engineer and president of Defense Communications Ltd., a Canadian government company formed for special war service, has been appointed chairman of Canada's new Air Transport Board, for a ten-year period. Mr. Henry, who is 60 years of age, was at one time deputy minister of the Department of Railways and Canals; later he was prominently connected with the Beauharnois Power Co. Other members are Air Vice Marshal Alan Ferrier, also an engineer, and J. P. Romero Vachon of Montreal.

The Air Transport Board will have complete control of all civil aviation in Canada. It will regulate all air traffic and will advise the government on ways and means of bringing about a rapid and well-planned expansion of air communication and transport in the dominion. The board will take over duties previously exercised by the Board of Transport Commissioners of Canada who are now left responsible for transportation by land and water throughout Canada.

. . .

Lima Highway Congress postponed till 1945

The State Department has announced that the fifth Pan American Highway Congress, originally planned to be held in Lima, Peru, last July 5-24, later postponed until Oct. 12-22 (*ENR* July 20, p. 69), has again been postponed until next year on specific dates to be announced later.

Association Elections and Activities

The North Carolina Society of Engineers has published the first issue of "North Carolina Engineer," a bimonthly publication edited at Raleigh by E. G. Hoefler and R. W. Youngsteadt. The publication, according to Edwin D. Burchard, president of the society, is designed to "compensate in part for the cancellation of the summer convention due to war restrictions, constitute an exchange in technical ideas and professional experience" and "serve as a medium for better acquaintanceship with each other and with our state during this period of dislocation."

Members of the professional development committee assisting with the editing of the magazine are W. H. Hall, Ira B. Mullis, John D. Spinks and Charles E. Waddell. G. W. Hutchinson is chairman of the committee on publications, and C. L. Barnhardt, W. E. Hawkins, C. E. Proudley and H. E. Wilson are chairmen of sub-committees on advertising contracts.

At a recent meeting of the Dallas, Tex., chapter of the American Society of Civil Engineers, Homer Hunter, water department superintendent, discussed features of the Dallas water supply system finished lately, and also future building projects of the system.

T. H. Cutler, Frankfort, Ky., chief engineer of the State Highway Department, has been named chairman of the Kentucky State Board of Registration for professional engineers, succeeding J. R. Kinsella, Newport.

W. D. Barrows, Providence, has been re-elected vice chairman and C. S. Crouse, Lexington, secretary-treasurer. Other members of the board include E. R. Ronald, Louisville, and Kinsella.

Roy L. Williamson of Raleigh, N. C., chairman of the nominating committee of the North Carolina Society of Engineers, reports nominees for new officers as follows: L. W. Payne, president; T. J. Hewitt and W. J. Seeley, vice-president; T. T. Betts and Carroll L. Mann, Jr., director for District I; W. Paul Lyman and H. D. Jones, director for District II; L. E. Whitfield and R. A. Thomas, director for District III; and Marshall E. Lake and W. E. Henry, Jr., director for District IV.

William L. Humphries was elected chairman of the Arkansas Highway Users conference at a recent meeting.

Other new officers are John Allen, vice chairman, and W. F. Scarborough, secretary. Members of the executive committee are Carl N. Bellingrath and W. B. Billingsley.

The Ontario Association of Professional Engineers has appointed T. M. Medland as a full time director of public relations. Colonel Medland has had distinguished service in the Canadian Army both in this war and the first world war. Between wars, he was engaged in the retail lumber business and house construction until in 1937 he became the organizer and first dominion secretary of the Canadian Corps Association. He left this post in September, 1939, to re-enter active service, from which he has just been released by the Department of National Defense.

...aster, better and at less cost!

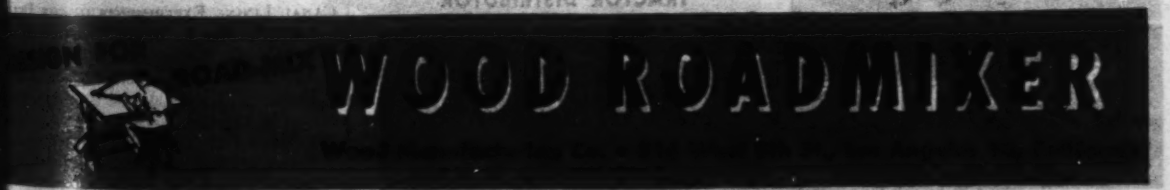
...lot of roads and airports will be needed after this war—and money ...n't be as easy as it is today. Taxpayers will demand an accounting ... every dollar spent. *Economy must become the watchword of the ...ion, after this wastage of war.* That's why road-mix and Wood ...admixers will be used for an ever increasing amount of construc-...n.

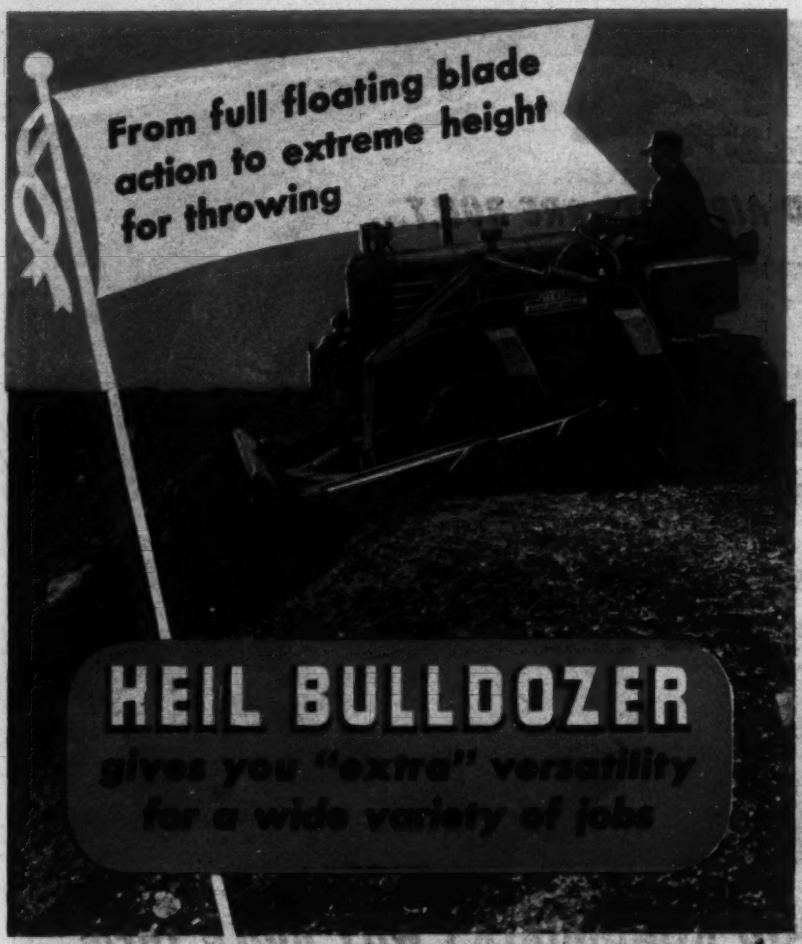
...ood Roadmixers use native and local materials, reducing hauling ...sts to a minimum. The Wood Roadmixer is a traveling mixing ...nt, eliminating the central plant and saving equipment and labor.

The Wood Roadmixer handles emulsions, road oils or soil-cement, giving wide choice of materials and methods to be used. And finally the Wood Roadmixer produces highest quality pavement, lower in first cost and lower in maintenance cost.

This all adds up to the fact that wherever roads and airports are built, today or tomorrow, Wood Roadmixers will build them faster, better, and at less cost.

Wood Roadmixers are complete traveling mixing plants, available in two sizes. They are sold through leading equipment dealers throughout the United States. If there isn't a dealer in your territory, write us for literature and costs of the Wood Roadmixer—*a complete traveling mixing plant.*

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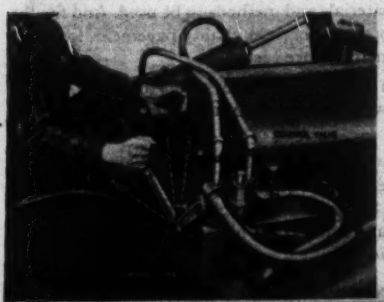
R-30

Write for bulletins



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RAISE position is back; HOLD position is center; DOWN position is forward. To float blade, push control lever to DOWN position until blade touches ground—then push down on control lever knob to release catch and move lever to extreme forward position.

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Reports and Pamphlets

(Continued from page 96)

LITTLE ROCK MUNICIPAL WATER WORKS—8th Annual Report ending Dec. 31, 194 Little Rock, Ark.

NEWTON, MASS.—Annual Report of the City Engineer and Planning Board for th year ending Dec. 31, 1943.

ST. LOUIS, MO.—The 28th Annual Report of the City Plan Commission, 1943-1944

NEW JERSEY—65th Annual Report of the Department of Health, 1942.

PORTLAND, MAINE—37th Annual Report o the Portland Water District, Jan. 1, 194 to Dec. 31, 1943.

RESISTANCE OF CONCRETE TO FREEZING AND THAWING AS AFFECTED BY AGGREGATES—By Stanton Walker. Circular 26. National Sand and Gravel Assn., Munse Bldg., Washington, D. C.

ECONOMIC AND STATISTICAL INFORMATION—A Graphic Presentation of Data Contained in "A Sound Plan for Postwar Roads and Jobs"—American Road Builders' Assn., 1319 F. St., N.W., Washington 4, D. C.

FACTS AND FIGURES ON GOVERNMENT FINANCE, 1944—The Tax Foundation, 30 Rockefeller Plaza, New York 20, N. Y.

STATE FINANCES, 1943—Bureau of the Census, U. S. Dept. of Commerce. For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. 20c.

COUNTY FINANCES, 1942—Bureau of the Census, U. S. Dept. of Commerce. For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. $1.

SEDIMENTATION IN A GREAT HARBOR—A reprint from *Soil Conservation*. By L. C. Gottschalk. U. S. Dept. of Agriculture, Soil Conservation Service, Washington, D. C.

CONFERENCE ON PLANS FOR POSTWAR HIGHWAYS—The University of Tennessee Record. Division of University Extension, Knoxville, Tenn.

FATIGUE STRENGTH OF FILLET-WELD AND PLUG-WELD CONNECTIONS IN STEEL STRUCTURAL MEMBERS—Bulletin No. 350, Engineering Experiment Station, University of Illinois, Urbana, Ill. $1.

CANAL LINING EXPERIMENTS IN THE DELTA AREA, UTAH—By Orson W. Israelsen and Ronald C. Reeve. Bulletin 313 Utah Agricultural Experiment Station, Logan, Utah.

WE MUST GET DOWN TO EARTH TO GET AMERICA INTO THE AIR!—National Aeronautic Association, Washington.

Here's How to Protect Your Machines This Winter . . .

Switch Now to the Extra Safety of ALEMITE Winter Lubricants

• Your machines have really been "taking it" all summer. Terrific schedules, record-breaking heat, 'round-the-clock operation. But now you're facing winter, when ordinary greases actually *cause* friction. Your machines are too valuable, parts are too hard to get to risk breakdown. So, play safe and protect your machines! Change now to Alemite *Winter* Lubricants.

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Risking gears this winter means risking whole machines and your business. Alemite *Winter* Gear Lubricants withstand extreme cold and pressures and still protect hard-working surfaces regardless of conditions. Change now and save a machine.

ALEMITE WINTER MOTOR OIL

Around the clock operation wears out ordinary oil fast. Zero weather increases the risk. Alemite Winter Motor Oil—100% Pure Bradford Pennsylvania crude stock—will stand up under the severest operating conditions. Available in all S. A. E. winter grades.

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...ard vital bearings against cold-weather ...iction with Alemite Sub-Zero Lubricant. ...alike ordinary grease which actually ...eases friction in cold weather, Alemite ...b-Zero Lubricant stays on the job at ...peratures down to 40° below! Switch ...w and save a machine!

ALEMITE No. 33 LUBRICANT

Exclusive with Alemite! Developed to provide a working temperature range from 25° below to 205° F. Ideal for equipment where bearing loads are high and resistance to rain and muck is vital. Won't clog grease guns or bearing lubricant grooves. This *exclusive* Alemite lubricant lasts longer, too!

Call in the Alemite Lubrication Specialist to explain "on-the-job" power lubrication for complete winter protection of machines. Write for his name to, Alemite, 1821 Diversey Parkway, Chicago 14, Illinois, or Belleville, Ontario.

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MD. . . . Baltimore—Paving Supply & Equipment Co.
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MICH. . . Bark River—Bark River Culvert & Equipment Co.
Detroit and Grand Rapids—
Wolverine Tractor & Equipment Co.
MINN. . . Minneapolis & Duluth—Thorman W. Roehdt Co.
MISS. . . . Jackson—Mississippi Road Supply Co.
MO. . . . . St. Louis—Missouri-Illinois Tractor & Equip. Co.
Kansas City—Noel V. Wood, Inc.
MONT. . Billings—Industrial Equipment Company
NEB. . . . Omaha—Nebraska Tractor & Equipment Company
NEV. . . . Reno—Allied Equipment, Inc.
N. H. . . . Chester—R. C. Hazelton Co.
N. J. . . . Trenton—Ross, Young, Ditts Corp.
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Buffalo—Dow & Company, Inc.
Brooklyn—Edward Ehrbar, Inc.
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OKLA. . . Tulsa & Guthrie—C. L. Boyd Company, Inc.
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PA. . . . . Butler—National Culvert & Equipment Co.
Pittsburgh—Brinker Supply Company
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R. I. . . . Providence—Tractors, Inc.
S. C. . . . Columbia—N. H. Summers Road Machinery Co.
S. D. . . . Sioux Falls and Rapid City—
Empire Equipment Company
TENN. . . Knoxville & Chattanooga—
Brooks Equipment & Mfg. Co.
Nashville—Industrial Tractor & Equipment Co., Inc.
Memphis—Road Builders Equipment Co.
TEXAS. . Dallas & Houston—Browning-Ferris Machinery Co.
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Howard-Cooper Corporation
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AD ON OPPOSITE PAGE

NEW AIDS TO THE CONSTRUCTOR

Paper Road Curing Blanket

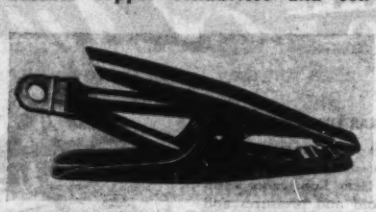
Unusual toughness and little shrinkage are found in "Skufpruf," a plastic-treated concrete curing paper, available in 10-ft. widths, the manufacturer states. The plasticizing treatment is thorough, resulting in complete impregnation of the individual pulp fibers. The 10-ft. width makes possible easier handling, and is said to save money, time and labor.

A "stringer sheet" method of prolonging the service of concrete curing blankets has also been developed. This stringer sheet, an 18 in. by 60-ft. strip of paper, eliminates that part of the curing blanket which overhangs the slab, where deterioration is most rapid. In addition, it is a time-saver when forms are removed.—*Richkraft Co., Chicago, Ill.*

• • •

Ground Clamp

Inexpensive and weighing only 1½ lb., a new ground clamp for welders has a heavy-duty processed steel frame with durable copper conductors and contacts. It has a jaw spread of 2½ in., and a rating of 300 amperes.



The clamp is designed so that each jaw connects independently to the ground cable; thus either jaw will carry the current if one is prevented from making a good electrical contact.—*Lincoln Electric Co., Cleveland, Ohio.*

• • •

Rechargeable Wet Battery

Built on the principle of an automobile wet storage battery, a new rechargeable wet flashlight battery is said to give excellent industrial service. This battery will supply about three hours of constant light. Batteries can be used in standard 3 or 5 cell cases with the use of spacer plugs.

Substantial savings are claimed for this battery, which is said to outlast the life of 400 dry cells. It requires a special type 600 mil Mazda lamp; while wattage consumption is 50 percent more than with the dry type, the wet battery is said to give a distinctly brighter light. Recharging equipment and tester are sold with this battery, which has a 6-month guarantee.—*B. F. Goodrich Co., Akron, Ohio.*

• • •

Decimal Point Locator Slide Rule

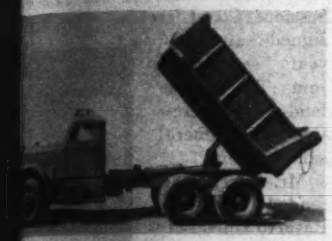
Useful in solving difficult problems even by persons with a limited mathematical background, a new slide rule and decimal point locator, called the Deci-Point, will determine the decimal point mechanically in involved expressions with results up to 19 digits or 19 zeros. It also obtains 30-in. scale accuracy for cube root and 20-in. scale accuracy for square root on a rule with

…ir, scales. With one setting of the …ir line this device will read square …t, cube root and legarithm; similarly, …h one setting of the hair line it will …termine the number of digits or zeros …the square root or cube root. A coat- …ket carrying case and manual are …luded.—*Pickett & Eckel, 53 West …kson Blvd., Chicago 4, Ill.*

• •

Twin-Arm Hoist

Capable of lifting loads of 24 tons to …0-deg. dumping angle in 10 to 15 …nds, according to the manufacturer's …nouncement, a new Twin Arm hy- …ulic hoist saves over 300 lb. of dead …ight on an 1,800 lb unit. This hoist,



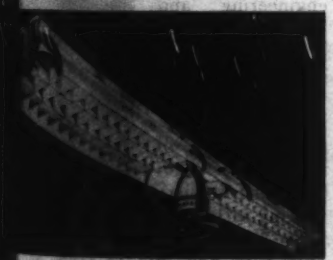
…pletely fabricated and welded, has …ooth and noiseless operation; the …y can be stopped and held at any …le without undue strain on the hoist …chanism.

This hoist will dump loads efficiently …n when the truck chassis frame is …ted because of uneven ground. Tests …e indicated that it will withstand …ch greater pressure than that of nor- …l load capacity.—*The Heil Co., 3000 …st Montana St., Milwaukee 1, Wis.*

• •

Fluorescent Luminaire

Relaxation of weight limitations by …PB has brought the return of Futur- …r, the fluorescent luminaire for con- …ous-flow illumination. It is made …2 and 3 rows of 40-watt lamps, to be



…nted directly to the ceiling, or sus- …ded. High-intensity shielded illum- …ion is provided, and maintenance …t is said to be low.

The Futurliter is available with cool- … air-disinfecting or color-improving …ions for special requirements.—*The …ard F. Guth Co., 2615 Washington …., St. Louis 3, Mo.*

WHEN
FUEL SYSTEMS
NEED A *Stout "Heart"*

"Rush more gas!"—that's the cry from all fronts. To speed up pumping under all conditions, pumping units are powered by stout-hearted air-cooled gasoline engines—one more vital war application for dependable, instant-starting Briggs & Stratton engines.

Air-Cooled Power

4 CYCLE
BRIGGS & STRATTON
GASOLINE ENGINES

Manufacturers of all types of equipment requiring dependable, compact power units are invited to investigate the performance advantages of Briggs & Stratton engines. Their world-wide acceptance is backed by 25 years of leadership in design and precision manufacture—and the production of more than two million *air-cooled* gasoline engines. BRIGGS & STRATTON CORP., Milwaukee 1, Wis., U. S. A.

HIGHWAY TRANSPORT . . . VITAL TO VICTORY AND THE AMERICAN WAY OF LIFE

Weapons in Waiting

Never before has the lumbering industry meant so much to America's welfare.

Wood is the principal material used in Army barracks and war workers' homes. Wood is a vital tool of the shipbuilder and war plant contractor. Landing barges, PT boats and Mosquito bombers are all constructed of wood. Wood has largely replaced steel in Army truck bodies. Wood has been put to a hundred and one new war uses . . . uses which save tons upon tons of critical metals for cannon and shell and fighting equipment.

Trucks opened up vast areas of virgin timber . . . are a main method of moving logs to the mill. Trucks transport a large per cent of the lumber to factories, shipyards, Army camps . . . deliver nearly all of it to farms and war housing areas. Today, the shout of "Timber" is a battle cry of victory.

In addition to producing thousands of military trucks and amphibian "Ducks," GMC is now manufacturing several thousand commercial trucks for use in essential civilian occupations. If you are eligible for a new truck, see your GMC dealer first for "The Truck of Value." Remember, too, that your GMC dealer is headquarters for the original truck-saving, time-saving Preventive Maintenance Service.

INVEST IN VICTORY . . . BUY MORE WAR BONDS

GMC TRUCK & COACH DIVISION
General Motors Corporation

Home of GMC Trucks and GM Coaches . . .
Volume Producer of GMC Army Trucks and Amphibian "Ducks"

MANUFACTURERS' ACTIVITIES

ANNOUNCEMENT has been made of t appointment of Hugo W. Liebert as ge eral works manager of the five genes machinery plants of the Allis-Chalme Manufacturing Co.

Liebert will direct units at West Al and LaCrosse, Wis.; Springfield; L Porte, Ind., and Oxnard, Calif.

G. RIDER NEFF, of The Lamson Sessions Co., Cleveland, Ohio, has r signed after 16 years service to join The Cleveland Cap Screw Co. as general sales manager.

Mr. Neff attended Western Reserve University and Case School of Applied Science. He spent two years in the Lamson & Sessions factori at Cleveland and Kent, Ohio, and th moved to the Chicago office for one yea In 1932 he was assigned to cover t Ohio territory for the company, and 1934 he covered the metropolitan Ne York and Philadelphia area. In 1937 was promoted to sales manager of t stove bolt division, and in 1939 w made sales manager of the aircraft a special products division. In 1942 advanced to his latest position, befo his resignation, that of advertising ma ager and manager of the aircraft a special products division.

RUSSELL H. LASCHE has been a pointed director of engineering and research for the Fairchild Camera & Instrument Corp. of New York.

A graduate of the University of Wisconsin's engineering school, Mr. Lasche has been with Fairchild 15 years, and r cently has directed all sales to the W Department. He was formerly in charg of the sound equipment division.

PITTSBURGH PLATE GLASS Co. wi build on a 14-acre tract of land Springdale, Pa., the first factory in th district for producing paint, varnish an lacquer.

3/4¢ PER SQ. YARD

ON A 23 FOOT SUBGRADE

The economy achieved by the use of a STANDARD-LEWIS subgrader is quickly seen in the report from one contractor (name on request). He writes that the total subgrading cost was only ¾ cents per square yard on a 6 mile paving job. The same economical operation can be yours. And added to this, the following unique features make this subgrader a "natural" for you.

The STANDARD-LEWIS Subgrader is designed with a sectional stationary cutting blade (adjustable to any desired subgrade contour) on each side so that grading may be done in either direction without turning machine, or time consuming "pull backs." It can be raised by power to pass over manholes, culverts and other obstructions while in operation. Wheels may be turned 90° to permit towing by truck or tractor over bridges or through narrow places. Many other features make it the one subgrader designed to meet post-war requirements for better, faster paving.

OTHER STANDARD PRODUCTS

ASPHALT PLANTS • BATCHING PLANTS • ASPHALT FINISHERS
CONCRETE FINISHERS • LOADERS • ROLLERS • POWER BROOMS

STANDARD STEEL CORPORATION

General Offices and Plant: 5001 South Boyle Avenue, Los Angeles 11, California
Distributors Throughout United States and Canada

QUIMBY PUMPS

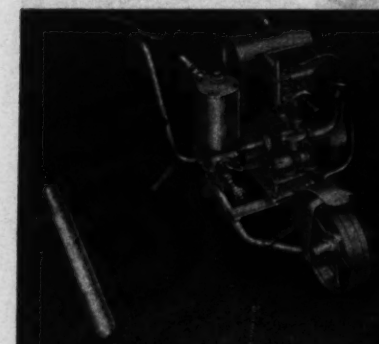
SCREW
ROTEX
CENTRIFUGAL
CHEMICAL

√ LESS FRICTION
√ LESS WEAR
√ LESS MAINTENANCE
IT ALL ADDS UP TO . . .
Longer Life!

PORTER Better by Design Equipment

QUIMBY VERTICAL SCREW PUMP

QUIMBY PUMP COMPANY
INCORPORATED
Division of H. K. PORTER COMPANY, Inc.
PITTSBURGH, PENNSYLVANIA
FACTORIES:
PITTSBURGH, PA. BUFFALO, N. Y.



Alert Contractors!
Buy the
JACKSON
Hydraulic
Concrete
Vibrator
for Dependable, Speedy Performance

- Automatic pressure lubrication—requires no attention.
- 24-ft. hose—8½" vibrator head.
- Adjustable frequency to 6000 R.P.M.—submerged in concrete.
- Powerful gas engine—4.7 H.P.
- Long-lived, ball-bearing, rotary, hydraulic pump.

THEY CAN "TAKE IT"
24 HOURS A DAY
7 DAYS A WEEK

ELECTRIC TAMPER & EQUIPMENT CO.
LUDINGTON, MICHIGAN

Industrial Rubber Products—Pr duced especially for designers of indu trial equipment as well as consume products, is a general booklet on indu trial rubber products. Included are di cussions of the devices of rubber an metal which reduce vibration; molde extruded, lathe cut and sponge rubb products; rubber lined tanks an valves; products made with a flexib material created from plasticized pol vinyl chloride; and V-belts and c ments.—**B. F. Goodrich Co., Akron,**

Welding Mild Steel—An entirely ne method for increasing the speed of wel ing mild steel—called "fleet-welding"— is described in a 48-page booklet ju published.—**The Lincoln Electric Co Cleveland, Ohio.**

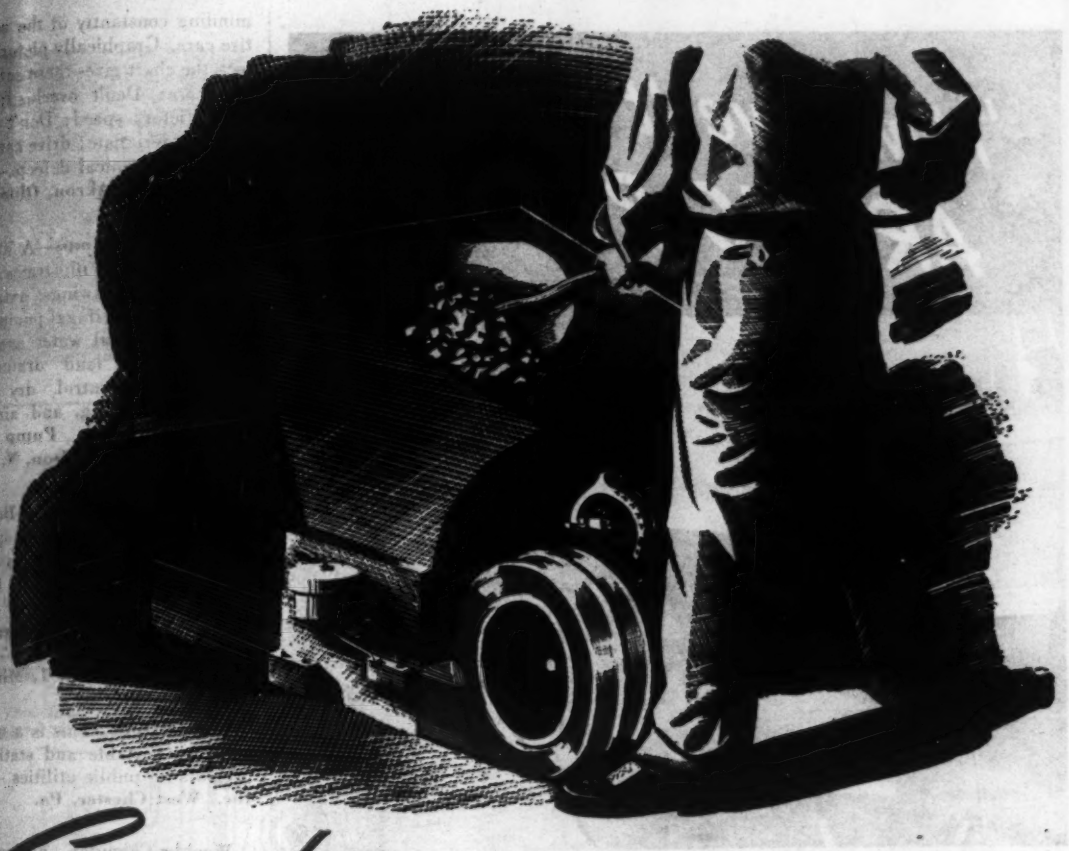
Wellpoint System—A 102-page cat log describes methods of dewatering e cavations. There are descriptions more than 90 types of construction, an nearly 200 illustrations of various job and working plans.—**Moretrench Corp 90 West St., New York 6, N. Y.**

Pavement Finisher—A bulletin d scribes a float finisher for which the claims are made: Keeps up with hig capacity mixers, steps up productio makes a smoother road surface, elim nates four to six hand finishers and efficient on vertical, horizontal an transverse spiral curves.—**Madsen Ir Works, Huntington Park, Calif.**

Motor Graders—Diesel powered, ta dem-driven motor graders are describe The manufacturers claim their produc have met satisfactorily every requir ment on the war and home fronts.—**Th Calion Iron Works & Mfg. Co., Galio Ohio.**

Roller Bearings—"Hyatt Folks an Hyatt Bearings" is the title of an inte esting brochure which is a picture re ord of the job these people and the products are doing to help win th war.—**Hyatt Bearing Division, Gener Motors Corp., Harrison, N. J.**

Truck Tires—Produced especially fo truck operators during this period extreme heavy duty tire shortages, thi chart can be used as a wall poster



Supercharger in your Basement?

When a well known principle suddenly blossoms out in a different way, a new name is usually found for it. So, blowers of certain types used in great quantities for aircraft engines have become known as "Superchargers".

Many of us use the "Supercharger" principle in our basements — the blower that forces large quantities of air into our coal stoker or oil burner. It is easily observed here that by delivering air to a fire in volumes greater than natural draft will draw in, the fuel burns faster and a hotter fire is created.

In the same way, the blower or "Supercharger", applied to a gasoline or oil engine, delivers more air to cylinders than the pumping action of the pistons will normally draw in. More fuel can be burned per stroke and correspondingly more power developed.

Equipped with Superchargers, engines for buses, trucks, railway cars, industrial locomotives, construction equipment, pumps, boats, etc. can handle heavier pay loads, have power in reserve when needed.

If you are an engine builder we will be glad to make recommendations for supercharging your engines. If you are an engine user, it will be smart to buy new engines either equipped with Superchargers or "designed for supercharging".

An industrial or logging locomotive with a supercharged engine has up to 40% greater hauling capacity.

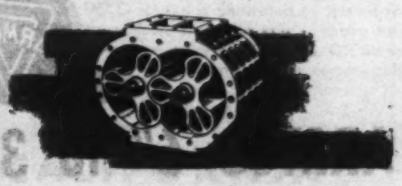
ENGINEERING PRODUCTION

SUPERCHARGERS, INC.

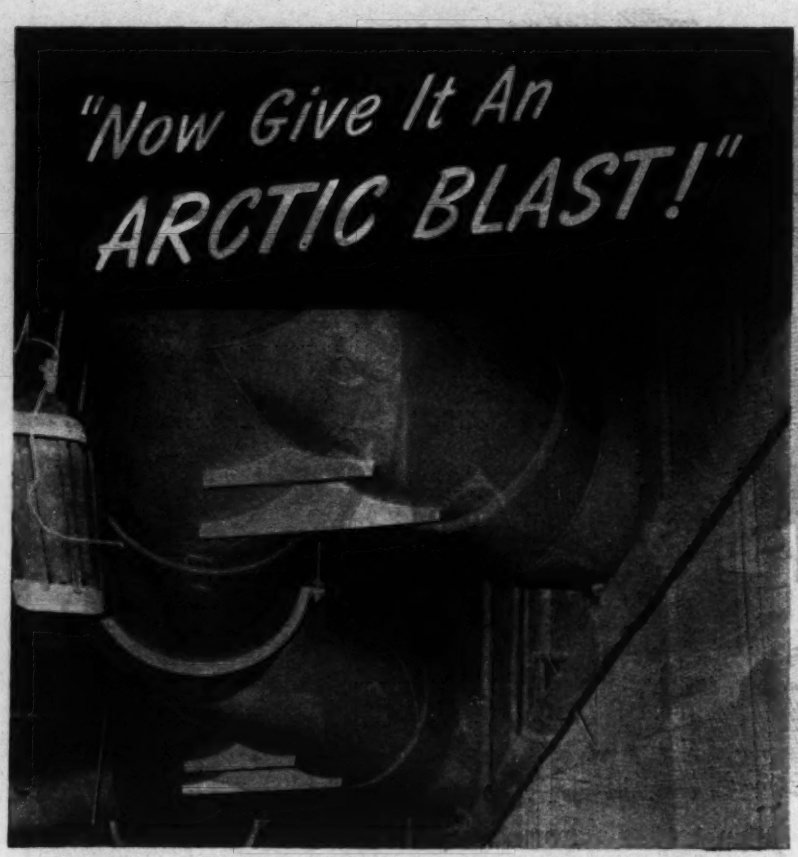
[Formerly McCULLOCH ENGINEERING CORP.]

A DIVISION OF BORG-WARNER

Milwaukee 9, Wisconsin



For duty on the roads or on the rivers B-W Superchargers carry through asking for little or no attention.



Altitude Exhaust System header in basement of Engine Research Building, Aircraft Engine Research Laboratory, Nat'l Advisory Committee for Aeronautics.

There isn't a dull moment in the life of an engine-testing laboratory's piping system. Its job is to conduct air that simulates all kinds of climatic conditions. Hot blasts often follow frigid air under forced draft—with a partial vacuum sandwiched in for good measure.

This is another piping task where all the advantages of prefabricated ARMCO Spiral Welded Pipe are utilized to the fullest.

LIGHT, STRONG WALLS

Light walls are needed to permit fast temperature changes; there can be no long and costly delays while the piping temperature adjusts itself. Yet the pipe must be sturdy enough to withstand air pressures. And with it all, this pipe must not interfere with the easy, accurate operation of all kinds of valves and measuring devices.

FEWER FLANGES

For years ARMCO Spiral Welded has been used for many kinds of industrial jobs. Fittings come welded to straight pipe runs. This means fewer flanges, fewer joints — less chance for leaks. Pipe is available with flanged joints or with ends prepared for field welding and mechanical joints. It is supplied mill-coated or galvanized.

We'll be glad to help with your special industrial piping problems. Sizes of ARMCO Spiral Welded range from 6 to 36 inches; wall thicknesses from 9/64 to 1/2-inch. Write for the illustrated bulletin —"6" to 36" Pipe for Industrial Uses." The American Rolling Mill Company, Pipe Sales Div., 3081 Curtis Street, Middletown, Ohio.

EXPORT: THE ARMCO INTERNATIONAL CORPORATION

ARMCO

ARMCO 6" to 36" STEEL PIPE

minding constantly of the necessity fo tire care. Graphically picturing the sub ject, the chart gives these seven rules fo tire care: Don't overload; Don't ex ceed Victory speed; Don't overinflate; Don't underinflate; drive carefully; an correct mechanical defects.—**The B. F Goodrich Co., Akron, Ohio.**

Centrifugal Pumps—A 50-page book let describes and illustrates with photo graphs and drawings axial-flow an mixed-flow centrifugal pumps for water works, industrial water supply, irriga tion, sewage, land drainage, storm water, flood control, dry dock, con denser circulating, and air condition ing.—**Worthington Pump and Ma chinery Corp., Harrison, N. J.**

Hoists and Derricks—Bulletins are available with complete specifications and construction details on steam, elec tric, gasoline, and belt hoists; car pullers; dredge and dock equipment; timber derricks; steel derricks; deck machinery and "whirleys."—**Clyde Iron Works, Inc., Duluth 1, Minn.**

Compressors—This is a new bulletin covering portable and stationary com pressors for public utilities.—**Schramm, Inc., West Chester, Pa.**

Weekly Calendar—Following recom mendations of draftsmen and engineers this calendar for 1945 has giant weekly dates all on one line, and large figured dates of previous and following months on each page. The big black numerals can be easily read from any part of the drawing room. The over-all size is 15¾ x 24½ in. A section of technical data for the engineer and draftsman is included, containing charts on wire and sheet metal gauges, screw threads, etc. —*The Frederick Post Co., Box 803 Chicago 90, Illinois.*

Plastic Coatings—A booklet of 16 pages describes the many uses of these coatings in a wide range of industries and includes a comprehensive list of organic and inorganic materials, equip ment and structures that are now being thus protected against corrosion or con tamination.—*Amercoat Division, Amer can Pipe and Construction Co., P. O. Box 3428 Terminal Annex, Los Angeles 54, Calif.*

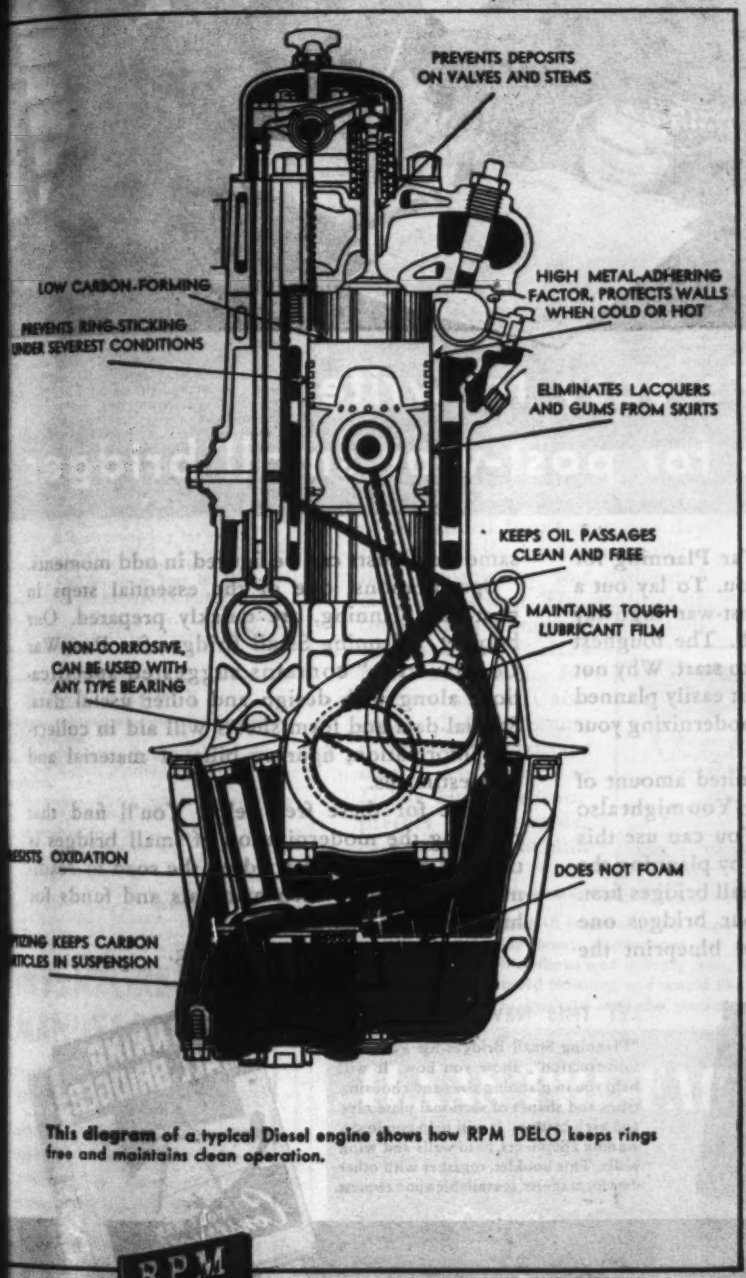
Decarbonators—A publication de scribing decarbonators for removing certain dissolved gases from water solu tion says that these decarbonators have been successful in application for re moval of carbon dioxide in connection with iron removal plants and with the degasification of hydrogen zeolite soft ened waters.—*Cochrane Corp., 17th & Allegheny Ave., Philadelphia 32, Pa.*

TYPICAL DIESEL LUBRICATION PROBLEMS:

4. Removal of Deposits from Engines

RPM DELO will clean your engine of sludge and other deposits, even in the ring-belt, unless accumulations of carbon, gum, varnish, etc., have cemented rings so tightly that oil cannot get behind them. The following procedure is recommended for purging conventional engine systems:

1. Drain present oil from crankcase while hot.
2. Renew filter element to trap abrasive particles that may be carried in circulation during purging.
3. Fill crankcase with RPM DELO.
4. Run engine at fast idle for two hours, maintaining water jacket temperature of approximately 200° F. minimum.
5. Drain again while hot and refill with RPM DELO.
6. Place engine in regular service and drain at one-half normal drain period or 750 miles, whichever comes first, for two or three drains. Check oil frequently as removal of deposits may temporarily increase oil consumption.
7. Drain while hot. Check oil filter and replace when necessary.
8. Refill with RPM DELO, returning to regular oil drain and filter change period, and continue to use RPM DELO.


PREVENTS DEPOSITS ON VALVES AND STEMS
LOW CARBON-FORMING
PREVENTS RING-STICKING UNDER SEVEREST CONDITIONS
HIGH METAL-ADHERING FACTOR, PROTECTS WALLS WHEN COLD OR HOT
ELIMINATES LACQUERS AND GUMS FROM SKIRTS
KEEPS OIL PASSAGES CLEAN AND FREE
MAINTAINS TOUGH LUBRICANT FILM
NON-CORROSIVE, CAN BE USED WITH ANY TYPE BEARING
ESISTS OXIDATION
DOES NOT FOAM
IZING KEEPS CARBON TICLES IN SUSPENSION

This diagram of a typical Diesel engine shows how RPM DELO keeps rings free and maintains clean operation.

RPM DELO is made from base oils especially selected for non-deposit-forming characteristics, and contains a detergent which keeps foreign particles in suspension. It also contains an anti-oxidant which prevents the formation of gums and lacquers. It is non-corrosive, may be used with any type of bearing.

RPM DELO has world-wide distribution and is marketed under the following names: RPM DELO, Caltex RPM DELO, Kyso RPM DELO, Signal RPM DELO, Sohio RPM DELO, and Imperial RPM DELO (Concentrate). Ask your Diesel engine manufacturer or distributor for the name of the RPM DELO supplier in your vicinity.

The typical cleanliness of engine parts when RPM DELO is used is illustrated by this oil filter removed from an engine used in heavy duty Diesel bus service for 50,000 miles. Oil pump screen and valve chamber were comparably clean.

RPM DELO

STANDARD OF CALIFORNIA

It's easy to write specifications for post-war small bridges

Don't let the sound of "Post-War Planning for Highway Engineers" frighten you. To lay out a complete program for your post-war highway requirements *is* a pretty big job. The toughest part of the job is to know *where* to start. Why not do the most effective and the most easily planned part of the job first? How about modernizing your small bridges?

You probably have only a limited amount of your own time to give to planning. You might also be short of engineering help. You can use this time and help to best advantage by planning the repair or replacement of your small bridges first.

You can inspect and rate your bridges one at a time. You can design and blueprint the same way. Costs can be figured in odd moments.

Specifications, one of the essential steps in post-war planning, are quickly prepared. Our booklet "Planning Small Bridges for Post-War Construction" contains suggested specifications along with design and other useful data. Special data and form sheets will aid in collecting information, figuring bills of material and cost estimates.

Write for these free helps. You'll find that planning the modernization of small bridges is the easy way to get started on the road to readiness for the day when materials and funds for highways are again available.

Now is the time to get going.

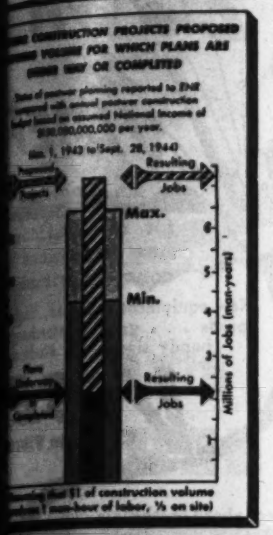
LET THIS NEW BOOKLET...

"Planning Small Bridges for Post-War Construction", show you how. It will help you in planning sizes and choosing types and shapes of sectional plate pipe and arch bridges. It will help you in designing abutments, head walls and wing walls. This booklet, together with other data form sheets, is available upon request.

TONCAN CULVERT MANUFACTURERS ASSOCIATION

REPUBLIC BUILDING · CLEVELAND 1, OHIO

STWAR PROJECTS



for postwar construction have in these columns since January, have been reported to Engineering

based on these reports are used by on Postwar Construction of the Society of Civil Engineers to measure of plans for postwar projects. above shows, both in estimated dol- and in jobs or man-years of labor, reservoir of future work is filling up. or your community are working on that have not yet been included in this reservoir," please send us an itemized description of them, including estimated the names of the engineers who are on the plans. Then as you watch the climb you will know that you and your ity are contributing to the success of the ONE JOB of preparing for peace. your projects list to Manager Busi- ews Department, Engineering News- 330 W. 42nd St., New York 18, N. Y.

MUM SIZE OF PROJECTS PUBLISHED

Works	$25 000
al Buildings	40 000
er Buildings	150,000

WATER SUPPLY

KED WORK

, New Canaan—City, First Tax Dis- water supply storage facilities, incl. 000,000.

Bozeman—City, addnl. reservoirs r sys. $100,000.

Portsmouth—Municipality, C. M. ayor, 126 Daniels St., water sys. 00,000.

Buffalo—City, N. L. Nussbaumer, Wks., City Hall, bldg. repairs and ip., Div. Water, $285,507. A. D. City Hall, dir. Water.

INVENTORS MANUFACTURERS

ventors: Have you patents for disposal here or abroad?

anufacturers: Are you seeking important new products or processes for present or future exploitation?

V. B. KAHN CO.

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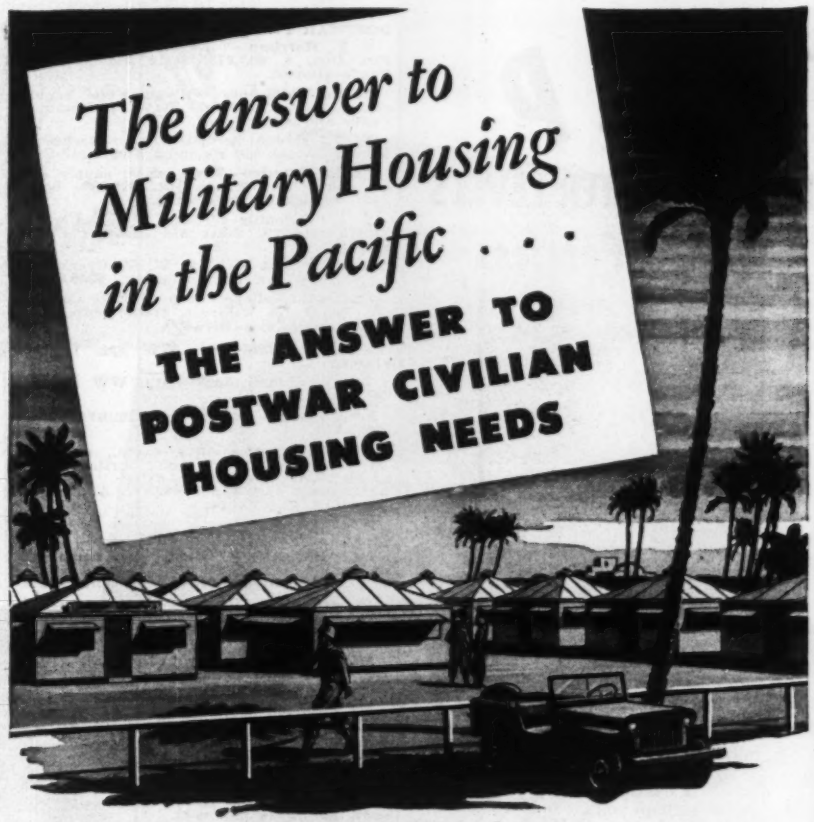


The answer to Military Housing in the Pacific . . .

THE ANSWER TO POSTWAR CIVILIAN HOUSING NEEDS

THE same Dallas Huts which have proved themselves in the service of the armed forces may one day provide sorely needed rehabilitation housing for war dislocated civilians, as well. The qualities of comfort and economy of operation which make Dallas Huts so suitable for military use, will also enable them to assume this new and important duty. And because Dallas Huts are completely salvageable, easy to erect, demount and transport, they can be sent wherever they are needed most, *fast.*

For postwar America, the civilian counterpart of the Dallas Hut opens broad new fields of efficient, economical housing. In service as comfortable homes for low income groups, as vacation cottages and living quarters for travelers and transient workers, Texas Pre-Fab Houses clearly provide the solution to quick, effective housing after the war.

We are proud to fly the Army-Navy "E" banner for efficiency

Today, the Texas PRE-FAB is growing by leaps and bounds, and offers attractive POST-WAR possibilities. Already many applications for current and post-war dealerships are being received—from both civilians and military men. If you visualize the tremendous potentialities for Texas Pre-Fabricated Housing, and would like a profitable part in the future of this rapidly expanding industry, sign and mail the coupon below.

TEXAS PRE-FAB

(TEXAS PRE-FABRICATED HOUSE AND TENT COMPANY)

Dallas, Texas

Shoreham Bldg., Washington, D. C.

MAKERS OF DALLAS HUTS AND TEXAS PRE-FAB HOMES

TEXAS PRE-FABRICATED HOUSING COMPANY (Distribution Division)
Avery and Beckley Streets
Dallas 8, Texas

Gentlemen:

I'm definitely interested in the future of this industry, and would like more information regarding a possible dealership arrangement for post-war.

Name _____ Capacity _____

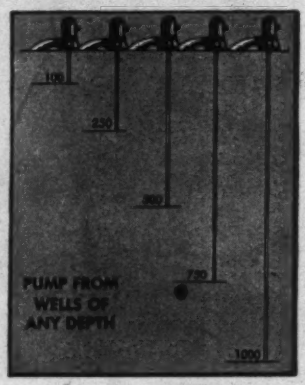
Current Address _____

Home Address _____
(if different from above)

City _____ State _____

Further Remarks _____

TAP
LOWER WATER LEVELS
with a Peerless



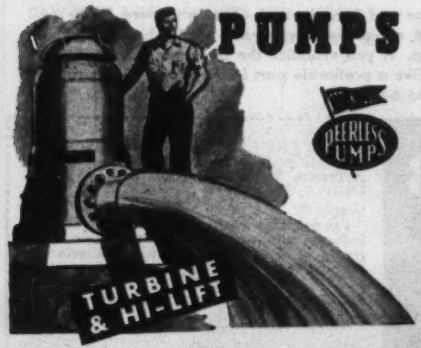
Water levels are receding in many parts of America. This critical situation was discussed most forcefully in a recent issue of The Saturday Evening Post. It's a problem that confronts many pump users—perhaps you.

To tap the lower water levels you need a Peerless Deep Well Pump. Look ahead. Make provision for a dependable source of water for years to come by going deeper for your water. Peerless Pumps will lift water from any depth and can be installed to meet the receding water levels. Some are installed more than 900 feet deep.

•

Peerless Pump heads are designed and engineered to carry the load. The Peerless Moturbo Head, with its built-in, hollow-shaft motor, water-cooled, over-size bearings and the shaft with oil or water-lubricated bearings, insures economical operation and high efficiency.

PEERLESS PUMPS



PEERLESS PUMP DIVISION
FOOD MACHINERY CORPORATION
301 W. Ave. 26, Los Angeles 31, Calif. • 1250 Camden Ave. S.W., Canton 6, Ohio • *Other Factories:* San Jose 5, Fresno 16, California

POSTWAR PROJECTS (Cont'd.)

N. Y., Harrison—Town, new water line for Fire Dist. 4, $17,675. State Aid Planning Funds allotted.

N. Y., Middleburg—Village, water supply expan., inprvs. $50,000. State Aid Planning Funds allotted.

N. Y., Mount Vernon—City, watermains. $40,000. State Aid Planning Funds allotted.

N. Y., Waterloo—Town, water supply sys. for Border City Water Dist. $70,000. State Aid Planning Funds allotted.

N. Y., Wyoming—Village, WW and water supply. $60,000. State Aid Planning Funds allotted.

Okla., Durant — City, W. T. Overstreet, mayor, WW sys. imprvs., exten. $350,000.

Pa., State College—Boro of State College, c/o Pauline J. Williams, acting boro secy., water supply sys. $200,000.

Tex., Amarillo—City, WW sys. imprvs. $75,000.

Tex., Highland Park—City, WW imprvs. $80,000.

Tex., Pampa—Town, water imprvs. $50,000.

★**Wash., Tacoma**—City, exten., replacing water distr. sys., replacing portions water supply line, $6,250,000; exten., replacing water distr. sys., $3,250,000. W. A. Kunigk, City Hall, water supt.

PLANS UNDERWAY

Ga., Rome—City, plans 75% completed watermain exten. $40,000. Roberts & Co., Bona Allen Bldg., Atlanta, consult. engrs.

Ia., Jefferson—City, H. D. Harding, mayor, City Hall, WW imprvs. $17,500. K. R. Brown, Valley Bank Bldg., Des Moines, consult. engr.

Mich., Ferndale—City, City Hall, 21205 Woodward Ave., plans underway East side watermain exten. in Wanda Aves., Nine Mile Rd., Hilton Ave., and Woodward Heights Blvd., $55,000; installing 149 fire hydrants and connections to city water sys., $48,500. J. F. Gibbs, City Hall, city mgr.

Mich., River Rouge—City, plans underway new gates, gate wells for addns., imprvs. to water sys. $20,000. Mason L. Brown & Son, 120 Madison Ave., Detroit, consult. engr. acting as city engr.

Mich., Wyandotte—City, plans 50% completed 4 mi. 6 in. c.i. iron watermain exten., with necessary specials, etc. $54,700. F. W. Liddle, City Hall, engr.

Neb., Hastings—City, E. L. Dier, clk., City Hall, WW imprvs., incl. piping, new 200 ft. wells, $25,000. P. T. Naylor, city engr.

Neb., North Platte—City, S. P. McFarland, mayor, WW and sewer imprvs. $135,000. R. F. Noskey, city engr.

★**Pa., Lebanon**—City, new gravity water supply, incl. dam and 20 mi. pipeline, $1,750,000. Site not purchased. Vote necessary bonds in November. Gannett Fleming Corddry and Carpenter, Inc., 600 N. 2 St., Harrisburg, consult. engr.

Tex., Liberty—City, c/o E. W. McClendon, mayor, City Hall, plans underway WW and sewage imprvs., incl. disposal plant, water well, and general imprvs., furnishing, installing 60 h.p. gas engine and generator, $100,000. Garrett Engineering Co., 1306 Milam St., Houston, consult. engr.

READY FOR BIDS.

Fla., Opalaca—Town, plans completed, ready for bids addnl. water supply and treatment plant. $50,000. Smith & Gillespie, Packard Bldg., Jacksonville, Zone 2, consult. engrs.

Mich., Wyandotte—City, plans completed approx. 6 rd. 6 in. c.i. watermain extensions for city sys., with specials, connections, $65,000. F. W. Liddle, City Hall, engr. CD 2/17—ENR 3/9.

PROJECTS CANCELLED.

Ark., Conway—F. Gordy, bus. mgr. Conway Corp., Conway, project cancelled. 600,000 gal. reservoir for municipal WW now going ahead. CD 7/19—ENR 8/10.

SEWERS, WASTE DISPOSAL

PROPOSED WORK

Ind., Mishawaka—Bd. P. Wks., J. A. Brady, chn., City Hall, sewage treatment plant. $100,000. Financing not yet provided for.

N. J., Vineland—Borough, Borough Hall, addnl. sewerage disposal plant. $50,000.

N. Y., Beacon—City, incinerator. $70,000. State Aid Planning Funds allotted.

N. Y., Brighton (sta. Rochester)—Sewer Dist. 2, Brighton, sanitary trunk sewer, $125,000; storm sewers, $105,000; exten. sanitary sewer, $10,000. State Aid Planning Funds allotted.

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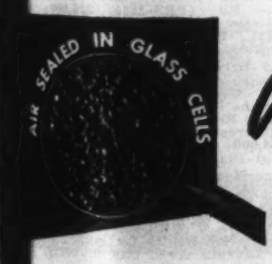

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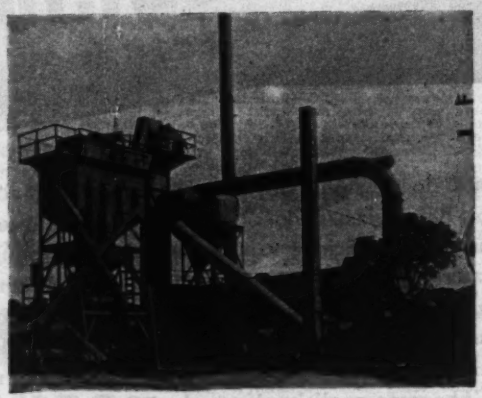

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POSTWAR PROJECTS (Cont'd.)

N. Y., Corning—City, incinerator plant and refuse collection and disposal sys. $125,000; State Aid Planning Funds allotted.

N. Y., Greenport—Town, enlarging sewage treatment plant, Dist. 1, $25,000. State Aid Planning Funds allotted.

N. Y., Mayville—Village, sanitary sewerage sys. and treatment plant. $200,000; State Aid Planning Funds allotted.

N. Y., North Syracuse—Village, sanitary sewerage sys. $325,000. State Aid Planning Funds allotted.

★**N. C., Raleigh**—City, G. Andrews, mayor, City Hall, incinerator. $300,000.

Pa., Turbotville—Borough Council, Spogen, pres., Turbotville, sanitary sys. throughout boro, incl. disposal plant. Over $25,000.

★**Tex., San Antonio**—Terrell Hills Improv. Dist., c/o City of San Antonio, sewage disposal plant in Terrell Hills suburb, $600,000.

PLANS UNDERWAY

★**Conn., Milford**—Town, Bd. Selectmen, Town Hall, 70,000 ft. sanitary sewer exten. sewage treatment plant, pump. sta. tion, etc. $719,000. Metcalf & Eddy, 12 Statler Bldg., Boston, Mass., consult. engrs. CD 3/31—ENR 4/20.

★**Fla., Hollywood**—City, plans 50% com. pleted sewerage sys. and storm drainage exten. $800,000. Smith & Gillespie, Packard Bldg., Jacksonville, Zone 2, consult. engrs.

Ga., Rome—City, plans 75% complete terra cotta sewerage sys. exten. $110,000. Roberts & Co., Bona Allen Bldg., Atlanta, consult. engrs.

Ill., Lawrenceville—City, G. L. McFarlane, mayor, City Hall, plans completed exten. sewerage sys. and new disposal plant, $300,000. Financing not yet provided for. Decatur Engineering Service Co., Decatur Club Bldg., Decatur, consult. engr.

★**Ind., Evansville**—Evansville Post War Comm., is selecting consulting engineer, sewage treatment plant. $1,000,000. R. T. Meslinger, City Hall, engr. CD 2/24—ENR 3/9.

Mich., Allen Park—City, plans underway sewage disposal plant. $59,250.

Mich., Caro—City, plans underway sewage disposal plant. $60,000.

★**Mich., Detroit**—Wayne Co. Road Comm., 3800 Barium Tower, 48- to 60-in., Middle Rouge Parkway Interceptor Sewer, Merriman to Ford Rds., $2,000,000. L. C. Smith, 3800 Barium Tower, Detroit, Wayne Co. Rd. Comm., engr.

Mich., Ferndale—City, plans underway Alberta-Livernois Ave. Outlet sewer serving west side area. $78,000. J. F. Gibbs, City Hall, engr.

★**Mich., Ferndale**—City, 21205 Woodward Ave., plans underway concrete cylinder sewer for East Side Trunk Sewer, $1,200,000; sewer on west side of Grand Trunk R. R. north of Chesterfield St., $5,000; Harvard Woodward Heights Outlet sewer, $5,000; Southwest trunk sewer exten., $20,000. J. F. Gibbs, 21205 Woodward Ave., city mgr.

★**Mich., Hamtramck**—City, 8540 Campau Ave., plans underway trunk line sewer. $2,000,000. I. M. Kopkowski, City Hall, engr.

Mich., Marquette—City, preliminary plans underway storm water sewer. Approx. $250,000. Shoecraft, Drury & McNamee, Ann Arbor, consult. engrs.

Mich., Milan—City, plans underway sewer extens. $89,250.

Mich., River Rouge—City, plans underway lateral sewerage sys. exten. for city. $150,000. Mason L. Brown & Son, 120 Madison Ave., Detroit, consult. engr., and acting as city engr.

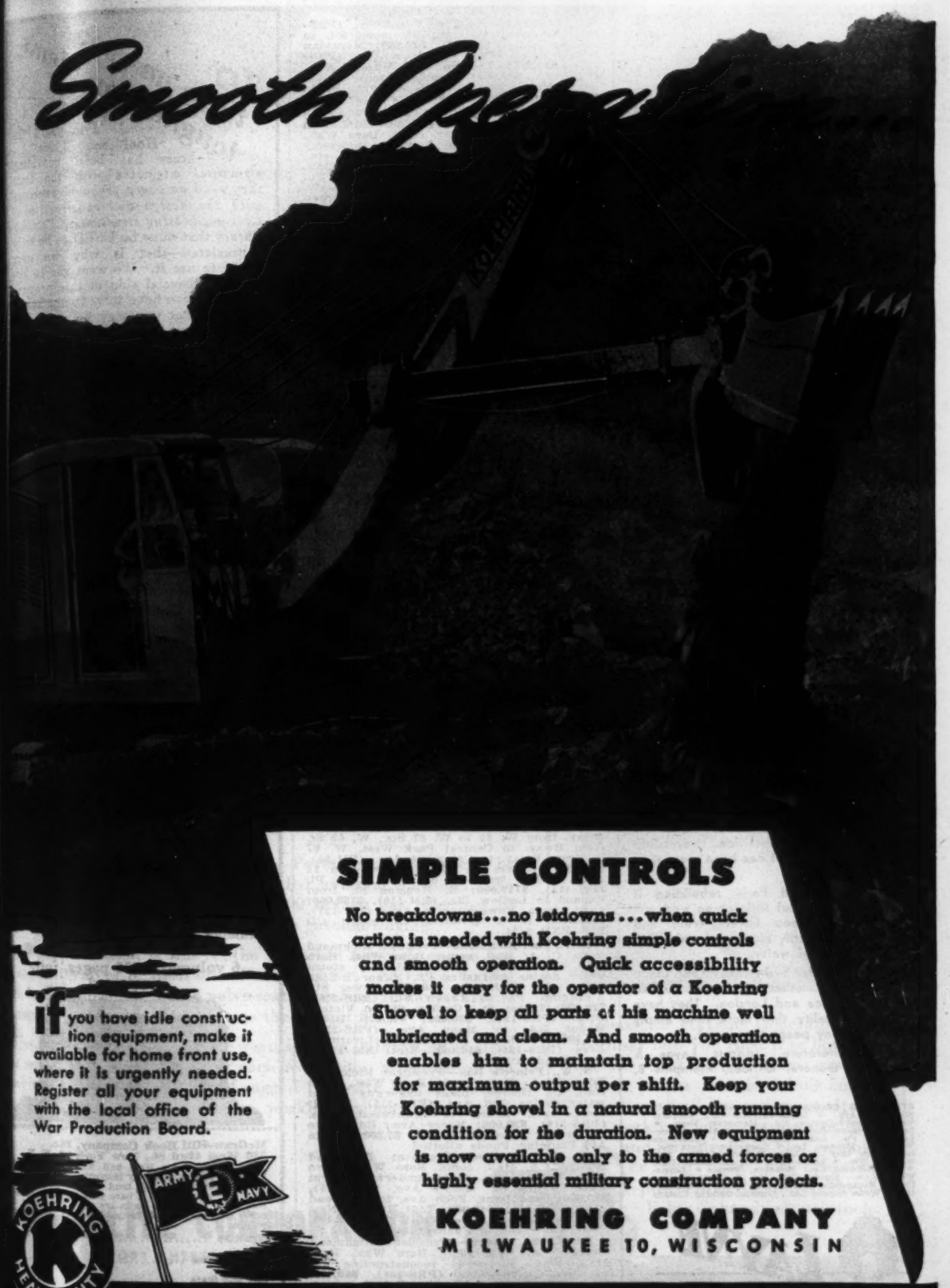
Mich., Wyandotte—City, plans 50% completed 12,808 ft. sanitary trunk sewer, Superior Blvd.-17 St., Sect. $47,300. F. Liddle, City Hall, engr.

★**N. Y., Buffalo**—City, N. L. Nussbaum, comr. Pk Wks., City Hall, municipal incinerator and garage, $1,360,000. Greeley & Hansen, 6 N. Michigan Ave., Chicago, consult. engrs. CD 11/15—ENR 11/18.

N. Y., Eltingville—President Richmond Boro, C. A. Hall, comr. Boro Wks., Boro Hall, St. George, plans underway storm water drains Wolcott Ave., Filer St. to Annadale Rd. (PRS-232), $42,000; Annadale Ave., Bathgate St. to Ocean Drive (PRS-132), $24,000. State Aid Planning Funds allotted.

N. Y., Great Kills—President Richmond Boro, C. A. Hall, comr. Boro Wks., Boro Hall, St. George, plans underway storm water drains Gibson Ave. (PRs-100), $24,000; Great Kills Rd. (PRS-217), $42,300; Wilkins Ave., Hillcrest Ave. to Hylan Blvd. (PRS-231), $43,000; Holly Ave. (PRS-218), $24,000. State Aid Planning Funds allotted.

N. Y., New Dorp—President Richmond Boro, C. A. Hall, comr. Boro Wks., Boro Hall, St. George, plans underway storm water drains Colfax Ave., Lisbon Pl. to Railroad Ave., (PRS-96), $37,200; Colfax Ave., Richmond Rd. to Lisbon St., (PRS-97), $30,000; Lincoln Ave., city property, (PR-



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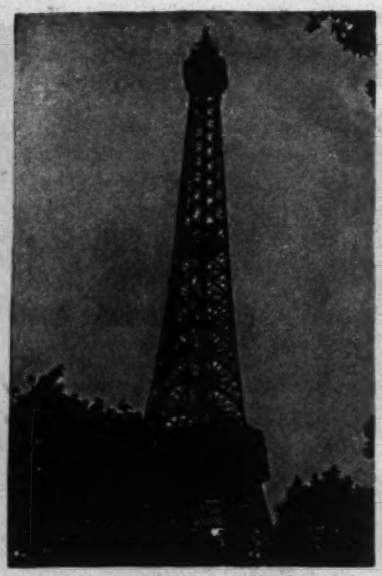

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POSTWAR PROJECTS (Cont'd.)

105), $5,000; Locust Ave., 3 to 5 Sts., (PRS-221), $28,400; Moore St., Richmond Rd. to Ardsley St., (PRS-223), $30,000; Moravian Brook, Hylan Blvd. to Lincoln Ave., (PRS-108), $30,000; Thomas St., Kensico Ave., (PRS-227), $30,000; Moravian Brook, Staten Island Rapid Transit R. R. to Hylan Blvd., (PRS-107), $40,000. State Aid Planning Funds allotted.

★**N. Y., New York**—President Manhattan Boro, W. D. Binger, comr. Boro Wks., Municipal Bldg., Zone 7, plans underway sewers 75 St., Madison to Park Aves., etc., (PMS-420), $28,600; 79 St., Amsterdam Ave. to 480 ft. east (PMS-421) $27,500; 110 St., 5 to Lenox Aves., (PMS-423), $82,500; W. 157 St. across Bway. and Edward Morgan Pl., etc., (PMS-424), $45,600, Park Ave. W/S, 60 to 64 Sts., (PMS-414), $71,000; West Bway., Canal to Leonards Sts., (PMS-415), $65,000; West Houston St., Varick St. to 6 Ave. exten., (PMS-416), $26,000; 12 Ave., W. 29 St. to 100 ft. south of W. 28 St., (PMS-417), $73,000; 12 Ave. at 30 St., (PMS-418), $38,500; W. 42 St., 8 to 9 Aves., (PMS-419), $40,000; Allen St., Rivington to Stanton Sts., (PMS-408), $19,300; Bway. W/S, W. 160 to 162 Sts., (PMS-409), $30,000; Columbus Ave., 100 to 104 Sts., (PMS-410), $54,000; E. Houston St., vicinity of Allen St. to 1 Ave., etc., (PMS-411), $57,000; Greene St., W. 4 St. to Waverly Pl., (PMS-412), $17,600; Lexon Ave., E/S, W. 116 to 120 Sts., etc., (PMS-413), $58,000; sewer exten. W. 96 St. (PMS-422), $50,000; exten. outlet sewer in Isham Park at Harlem Ship Canal, (PMS-425), $35,000. D. G. Edwards, ch. engr.

★**N. Y., New York**—President Manhattan Boro, W. D. Binger, comr. Boro Wks., Municipal Bldg., Zone 7, plans 85% completed outlet sewer, W. 66 St. (PM-45), $100,000; plans 75% completed reconstructing sewers in West End Ave. from 81 to 86 Sts., and in 81 St. from Bway. to Riverside Dr. (PM-78), $150,000; plans 35% completed reconstructing sewers in Canal St., from Bway. to Washington St. (PM-69), $250,000; plans 30% completed sewers in Vestry St. from Hudson St., to North River (PM-69), $120,000. D. G. Edwards, ch. engr.

★**N. Y., New York**—President Manhattan Boro, W. D. Binger, comr. Boro Wks., Municipal Bldg., Zone 7, plans 80% completed sewers in Madison Ave from E. 59 to E. 61 Sts., E. 61 St., from Madison to York Aves., E. 59 St., from 5 to Park Aves., (PM-57), $511,000. D. G. Edwards, ch. engr. CD 1/25/43—ENR 1/28/43.

★**N. Y., New York**—President Manhattan Boro, W. D. Binger, comr. Boro Wks., Municipal Bldg., Zone 7, reconstruction sewers, west side of Lenox Ave. from Cathedral Pkway. to W. 120 St. (PM-114), $200,000; Ft. Washington Ave. from W. 159 to W. 165 Sts. (PM-117), $97,000; E. 2 St. from Third Ave to Ave. C (PM-121), $191,000; E. 13 St. from Ave. C to Second Ave., and Ave. A from E. 13 to E. 14 Sts. (PM-123), $128,000; E. 10 St. from Ave. A to Bowery (PM-124), $114,000; E. 7 St. from Third Ave. to Ave C (PM-125), $178,000; E. 6 St. from Third Ave. to Ave. C (PM-126), $161,000; Pike St. and Pike Slip, South to Division Sts., incl. storm water overflow at Pike Slip and South St. (PM-130), $97,000; W. 65 St. from Amsterdam Ave. to Bway., Bway. from W. 62 to W. 67 Sts., W. 62 St. from Bway. to Central Park West, W. 67 St. from Bway. to Columbus Ave. (PM-96), $176,000; sewers W. 230 St., Bway to 12 Ave., 12 Ave. from 130 St. to St. Clair Pl. (PM-115), $142,000; E. Houston St. from Cannon to Ludlow Sts. (PM-119), $139,000; 4 St. from Bowery to 6 Ave. (PM-127), $134,000. D. G. Edwards, ch. engr. CD 2/2—ENR 2/24.

N. Y., Port Richmond—President Richmond Boro, C. A. Hall, comr. Boro Wks., Boro Hall, St. George, plans underway storm water drains Alexandra Pl., Manor Rd. to Gower St. (PRS-210), $20,000; Gower St., Alexandra Pl. to Lester St. (PRS-216), $20,000; Lester St., Graden St. to Victory Blvd. (PR3-104), $20,000; Victory Blvd., Manor Rd. to Mann Ave. (PRS-229), $41,400; Watchogue Rd., Fiske to Livermore Aves. (PRS-125), $46,400. State Aid Planning Funds allotted.

N. Y., Prince's Bay—President Richmond Boro, C. A. Hall, comr. Boro Wks., Boro Hall, St. George, plans underway storm water drains Goff Ave. (PRS-215), $5,400; Ionia Ave., Arden to Grantwood Aves. (PRS-219), $30,000; Marcy Ave., Edgegrove to Hawley Aves. (PRS-222), $7,200. State Aid Planning Funds allotted.

N. Y., Rosebank—President Richmond Boro, C. A. Hall, comr. Boro Wks., Boro Hall, St. George, plans underway storm water drains St. Mary's Ave. (PRS-113), $15,000; Sand Lane, Foch Ave. to Bulkhead Line (PRS-224), $48,000; Todt Hill Rd. New York to Redmond Aves. (PRS-228), $42,400. State Aid Planning Fundsgallotted.

N. Y., St. George—President Richmond Boro, C. A. Hall, comr. Boro Wks., Boro Hall, plans underway reconstructing 400 manholes island-wide (PRS-208), $50,000. State Aid Planning Funds allotted.

N. Y., Stapleton—President Richmond Boro, C. A. Hall, comr. Boro Wks., Boro Hall, St. George, plans underway storm water drains Seneca Ave., Victory Blvd. to Schoharie St. (PRS-226), $46,700; Canandaigua Ave., Schoharie to Tioga Sts. (PRS-

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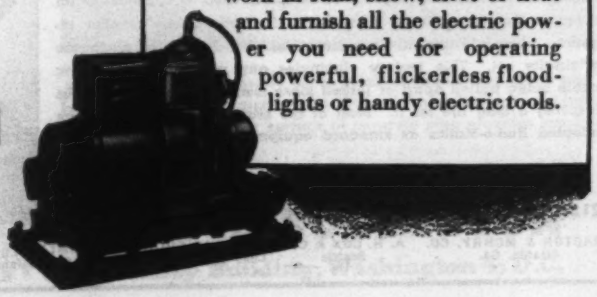

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POSTWAR PROJECTS (Cont'd.)

94), **$30,000**; Schoharie St., Seneca St. to Canandaigua Ave. (PRS-225), $30,000; Townsend Ave., Bay St. (PRS-122), $10,000; Dozer St., Baring Pl., to St. Pauls Ave. (PRS-123), $15,000; Young St. (PRS-231), $7,000. State Aid Planning Funds allotted. CD 3/11/43—ENR 3/18/43.

N. Y., West New Brighton—President Richmond Boro, C. A. Hall, comr. Boro Wks., Boro Hall, St. George, plans underway storm water drains Taylor St., Castleton to Delafield Aves., (PRS-121), $43,000; Henderson Ave., Bway. to Alaska St., (PRS-129), $43,000; Bway., Cary to Henderson Aves., (PRS-133), $43,000; Bway., Coughlin to Forest Aves., (PRS-134), $43,000; Bway., Forest to Cary Aves., (PRS-135), $43,000; Alaska St., Henderson Ave. to Woodruff Lane, (PRS-86), $30,000; Alaska St., Woodruff Lane to Killvon Kull, (PRS-87), $48,000; Bement Ave., Forest Ave. and other streets (PRS-121), $25,000; Walnut St., Bard to Kissel Aves., (PRS-210), $20,000; Castleton Ave., Taylor to Alaska Sts., (PRS-95), $34,000. State Aid Planning Funds allotted. CD 3/11/43—ENR 3/18/43.

O., Alliance—City, sewage pump. station in east end c.ty **$35,000**. W. D. Sponseller, city engr.

O., New London—Village, J. W. Nelson, clk., plans 20% completed, sewage treatment plant. **$25,000**. Financing not yet provided for. Granville E. Scott, Norwalk, engr.

Okla., Woodward—City, preliminary plans underway sewage disposal plant. $50,000. Alexander & Pollard, Terminal Bldg., Oklahoma City, engrs.

Pa., Fountain Hill—Borough Council, J. F. Taylor, burgess, Boro Hall, plans underway storm water sewerage sys., exten. sanitary sewerage sys. Over **$45,000**. L. J. H. Groesart, c/o owner, borough engr.

Tex., San Antonio—City, G. Mauermann, mayor, City Hall, approx. 250,000 ton daily cap. incinerator, **$275,000**. H. E. Burns, Tower Petroleum Bldg., Dallas, engr. T. Cochill, city engr.

B. C., Kelowna—Municipality, plans completed duplication present sewage disposal plant, one imhoff septic tank, filter and sludge beds. **$35,000**. H. A. Blakesborough, P. O. Box 78, engr.

READY FOR BIDS.

Fla., Gulfport—Town, plans completed sanitary sewage imprvs., facilities, incl. treatment and disposal plant. $275,000. Smith & Gillespie, Packard Bldg., Jacksonville, Zone 2, consult. engrs.

Mich., Wyandotte—City, City Hall, plans completed 2,314 lin. ft. combined sanitary and storm sewer (trunk sewer) north of Clinton St., **$14,900**; 4,566 ft. combined sanitary and storm trunk sewer between North Drive—Fourth St. and Goddard Rd.—Second St., **$112,000**; catch basins, manholes and 22,830 ft. 8 and 12 in. connections, $31,000; 4,550 ft. sanitary trunk sewer in vicinity of Alkali St. and railroads, **$16,800**. F. W. Liddle. City Hall, engr. CD 2/17—ENR 2/

Minn., Blue Earth—City, W. Enger, clk., City Hall, plans completed sanitary sewerage sys., sewage disposal plant, taking care of domestic and canning plant sewage. $200,000. Toltz, King & Day, 1509 Pioneer Bldg., St. Paul, consult. engrs. CD 2/18—ENR 2/

N. Y., New York—President Manhattan Boro, W. D. Binger, comr. Boro. Wks., Municipal Bldg., Zone 7, plans completed re constructing sewer in E. 79 St. from Park Ave. to East River Dr. (PM-82), $251,000. D. G. Edwards, ch. engr. CD 2/1/43—ENR 2/4/43.

★**N. Y., New York**—President Manhattan Boro, M. D. Binger, comr. Boro Wks., Municipal Bldg., Zone 7, plans completed reconstructing sewers Amsterdam Ave. from 179 to 189 Sts., (PM-79), **$125,000**; Academy St. from Nagle to Vermilyea Aves., and in Vermilyea Ave. from Academy to W. 2 Sts., (PM-75), **$150,000**; E. 74 St. from Park

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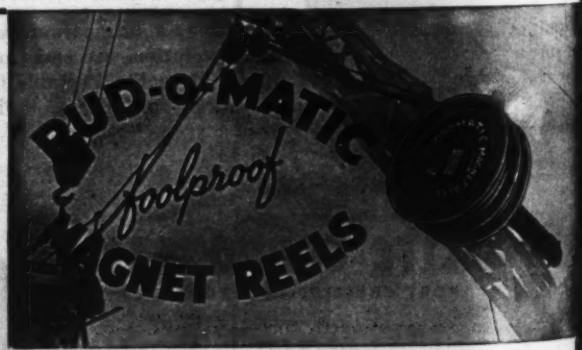

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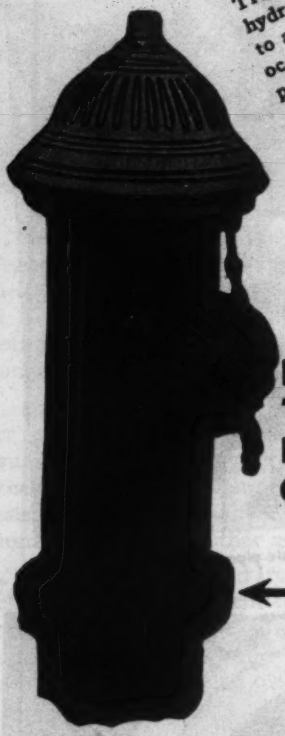

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POSTWAR PROJECTS (Cont'd.)

Ave. to East River, (PM-74), $250,000; 106 St. from Lexington to 5 Aves., and Madison Ave. from 99 to 106 St., (PM-$182,000; E. 110 St. from Lexington to Aves., (PM-70), $150,000; Nagle Ave. from Elwood to Dyckman Sts., $99,000; rebuild and eliminating separate sys. of sewers Park Terrace East, Park Terrace W. Seaman Ave., W. 215, W. 217 and W. Sts., (PM-73), $200,000; sewers in W. 22 from 5 to 11 Aves., (PM-77), $300,000. R. Edwards, ch. engr.

N. Y., New York—President Manhat Boro, W. D. Binger, comr. Boro Wks., Municipal Bldg., Zone 7, plans comple sewers in W. 72 St. from Amsterdam A to New York Central R. R., (PM-44). $ 000. D. G. Edwards, ch. engr. CD 1/25/ ENR 1/28/43.

N. Y., New York—President Manhat Boro, W. D. Binger, comr. Boro Wks., nicipal Bldg., Zone 7, plans comple sewers in Madison Ave. from E. 54 to E St., etc. (PM-105), $122,000. D. G. Edwa ch. engr. CD 2/1/43—ENR 2/4/43.

BRIDGES

PROPOSED WORK

Conn., New Canaan—Town, C. S. R mond, clk., 2 arch type bridges over Mile River, Valley Rd. and Jelliffe $50,000.

Me., Rumford Falls — Municipality, Merton Wyman, town mgr., bridge const tion. $60,000.

N. Y., Niagara Falls—City, Gill C bridge and street imprvs., $60,000; re structing 2 bridges over Bergholz Cr $50,000. State Aid Planning Funds allot

N. Y., Nunda—Comrs. Livingston Co., locating undercrossing, Co. Rd. 34, $4 replacing 3 bridges over Honeoye Cr $75,000. State Aid Planning Funds alle

N. Y., Schenectady—Comrs. Schenect Co., Schenectady, bridges, Pangburn Rd. Hy. 14P, Van Vorst Rd. Co. Hy. 38G, Sc Ridge Rd. Co. Hy. 10P, Muselbeck Rd. Hy. 4P. $55,000. State Aid Planning Fu allotted.

★**N. Y., Syracuse**—Comrs. Onondaga Syracuse, reconstructing Bridge T-1, T Tn. Hy., Bridge T-13, Davis Tn. Hy., Bri T-4, Railroad St., Bridge T-5, Tn. of Elbri Bridge T-3, Nichols Tn. Hy., Bridge T Gates Tn. Hys., Bridge T-15 on Dodge Tn. Hy., Bridge T-16 on Palmer Tn. Bridge T-17 on Weller Tn. Hy., Bridge T on Woodard Tn. Hy., Bridge T-11, Burl Tn. Hy., Bridge C-145, Memphis-Whiting Rd., Bridge C-30 on Case Tn. Hy., Bri C-41 Walberger Tn. Hy., Bridge C-157 F port Tn. Hy., and Bridge C-162 Ver Cardiff Co. Rd. 234, $113,500; Bridge T Hamilton Town Rd., $9,000; Bridge T-1 Whitestone Tn. Hy., $16,000. State Planning Funds allotted.

N. Y., Warsaw — Comrs. Wyoming Warsaw, bridge reconstruction, Attica Bri 6, Java Bridge 11, Middlebury Bridge Orangeville Bridge 7, Whetersfield Bri 6, Perry Bridge 2. $123,100. State Planning Funds allotted.

N. Y., York—Comrs. Livingston Co., bridge over Genessee River. $150,000, St Aid Planning Funds allotted.

United States and Canada — Minne State Hy. Dpt., St. Paul, Minn., Province of Ontario, Ottawa, bridge ac Pigeon River on Highway 61, below Falls. Over $25,000.

PLANS UNDERWAY

★**Ill., Decatur** — City, City and Co Bldg., grade separation at I.C.R.R. E. Garfield Ave., $250,000; crossing pro tion at N. Bway and I.C.R.R. $5,000; g separation at E. Wood and I.C.R.R. Bway. St., $500,000; grade separation Bway. and Wabash R.R., $300,000. J. Weir, city engr.

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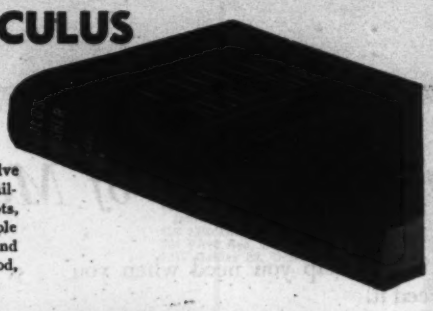

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POSTWAR PROJECTS (Cont'd.)

Ill., Decatur — Bd. S[upervs. Macon] surveys completed Rhe[a's Bridge Sect.] MFT SA Route 24, $3[0,000]; surveys progress Wabash Subway Sect. 7-B, M SA Route 24, $75,000; preliminary estima only Sangamon River Bridge, Sect. 12 MFT SA Route 53, $60,000. A. Buck, s County Roads and engr.

Mich., Detroit—Wayne Co. Road Co[m.] 3800 Barium Tower, plans underway s[tr.] rein.-con. bridge for grade separation Wayne Rd. and Hines Dr. and Rouge Ri[v.] $125,000; bridge at separation of hy. gra steel, rein.-con. bridge span on rein.-c abutments, Merriman Rd. over Hines $75,000; structural steel, rein.-con. bridges on rein.-con. abutments, over Ro River, Hines Dr., east of Merriman $50,000; over Rouge River on Hines Dr., of Merriman Rd., $50,000. L. C. Smith, Barium Tower, engr.

★**Mich., Ferndale** — City plans under[way] concrete, steel grade separation carry hy. under railroad at Hilton Ave. and T Mile Rd., and Grand Trunk Railway, $1,5[00,] 000, J. P. Gibbs, City Hall, city mgr.

★**New York** — Long Island State P[ark] Comn., Babylon, plans underway f[or] ft. bridge across Great South Bay ki[ng] as Captree Bridge connecting Conk Point, West Islip with Captree Island bascule bridge across State Boat Cha from Captree Island to Ocean Blvd. on Beach, $5,000,000. Waddell & Hardesty, Park Ave., New York, Zone 17, con[sul] engrs.

★**N. Y., Buffalo**—City, N. L. Nussbau[m,] comr. P. Wks., City Hall, repla viaducts Babcock St. $460,000, Hamburg $900,000, Louisiana St. $600,000, South Ave. $325,000. Michigan Ave. $900,000; pairing concrete walls at viaducts, pan bridges, $400,000; new sidewalks and pairs, $432,000; South Michigan Ave. br $800,000, E. P. Lupfer, Ellicott Sq., Buf and William Russell Davis, 122 S. Pine Albany 3, consult. engrs.; Ohio St. Br over $1,000,000, T. H. McKaig, 505 Dele Ave., Buffalo, and Waddell & Hardesty, Park Ave., New York, N. Y., consult. en R. White, city engr. for all projects.

N. Y., New Dorp—President Richm Boro, C. A. Hall, comr. Boro. Wks., H Hall, St. George, plans underway culver Lighthouse Rd. near Richmond Rd. (F 220), $30,000. State Aid Planning F allotted.

★**N. Y., New York**—President Manha Boro, W. D. Binger, comr. Boro. W Municipal Bldg., Zone 7, plans 5% c pleted East River Drive Viaduct along S St., from Broad to Montgomery Sts. (50), $5,543,000; plans 30% completed East River Drive Viaduct, E. 30 St. to H (PM-51), $2,224,000. D. G. Edwards, engr.

★**Washington**—State Hy. Dpt., Olym P. Bantz, dir., plans underway rebuil Tacoma Narrows suspension bridge, $ 000,000. CD 2/10/43—ENR 2/18/43.

STREETS AND ROADS

PROPOSED WORK

N. Y., New York Mills—Village, im Walcott, Floyd and Sanquoit Sts. $2[3,] State Aid Planning Funds allotted.

N. Y., Pleasantville—Village, exten. To kins Ave. $50,000. State Aid Plan Funds allotted. CD 11/24—ENR 12/1.

N. Y. Rockville Center—Village, pa Maple Ave., $41,600; Knollwood Rd., $14,4 Grand Ave., $42,600; Raymond St., $11,[2] Woods Ave. and Park Pl., $20,200. State Planning Funds allotted.

★**N. Y., Schenectady**—Comrs. Schenec Co., Schenectady, constructing Co Rd. 151 and Route 30; County Rd. 24-2 18-D; Connecting Rd. from Route 7 to R 405; feeder road from Albany Co. L widening, resurfacing connecting road; placing portion of road; reconstructing R Route 5-S—R-159; regrading portion nection road; eliminating hazardous cu pass; Co. Rd. 54 to Rd. 50; realignment R 116; widening connecting road; direct r from Schenectady to Albany; Schenec Co. Airport Access Rd. $601,612. State Planning Funds allotted.

N. Y., Springwater — Comrs. Living Co., relocating Co. Rd. 42. $40,000. S Aid Planning Funds allotted.

★**N. Y., Syracuse**—Comrs. Onondaga Syracuse, new county road, $675,000; cating Thompson Rd., $106,700; reconstr ing W. Otisco Valley Town Hy. as co road, $19,000; reconstructing Rip Hill $32,000. State Aid Planning Funds allo

N. Y., Warsaw—Comrs. Wyoming Co., W saw, constructing Bennington-Darien, Glenn Iris, Whethersfield, Fitzmorris, Kay, Roper and Kelly Rds. $410,000. Aid Planning Funds allotted.

Okla., Durant—City, W. T. Overa mayor, paving. $100,000.

Pa., State College—Boro of State Col c/o Pauline J. Williams, acting boro s street paving. $300,000.

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POSTWAR PROJECTS (Cont'd.)

Pa., York—City, c/o City Council exten, poor house run project. Financing not yet provided for. $3

Tex., Amarillo—City, street imprvs., ing, drainage, paving, etc. $110,000.

Tex., Highland Park—City, street im $80,000.

Tex., Pampa — Town, street im $100,000.

★**Washington**—State H. Dpt., Olym B. Bantz, dir., constructing road Buckley to Mud Mountain dam, straightening, paving highway from rows Bridge to Bremerton, Kitsap $900,000; grading, paving highway Tac to Tenino, $1,120,000; new highway, Tac to Issaquah, $900,000.

PLANS UNDERWAY

★**Colo., Denver**—State Hy. Dpt., Den and City of Denver, selected Crocke Ryan, engrs., 1st National Bank Bldg. make survey of Platte River Dr. $12,500,000.

★**Ill., Decatur**—Bd. Supervs. Macon City and County Bldg., preliminary mates only grading, drainage structure tuminous surfacing, Sect. 19 MFT SA R 18, $43,500; Sect. 21, MFT SA Route $45,000; Sect. 21, MFT SA Route 24, $3 Sect. 22, MFT SA Route 24, $40,000; 23, MFT SA Routes 34 and 35, $ Sect. 24, MFT SA Routes 34 and 35, $ Sect. 25, MFT SA Route 18, $34,000; 26, MFT SA Route 54, $40,000; Sect. MFT SA Route 54, $32,000; Sect. 28, SA Route 41, $71,000; Sect. 29, MFT Route 52, $46,000; Sect. 30, MFT SA R 18, $46,000; Sect. 31, MFT SA Route $77,000; Sect. 32, MFT SA Route 49, $ Sect. 33, MFT SA Route 30, $20,000; 34-B, MFT SA Route 19, $120,000; Sect MFT SA Route 29, $40,000; Sect. 12, SA Route 53, $30,000; Sect. 13, MFT Route 53, $39,000; Sect. 14, MFT SA R 37, $30,000; Sect. 15, MFT SA Route $30,000; Sect. 16, MFT SA Route 36, $ Sect. 17, MFT SA Route 38, $48,000; plans in preparation Sect. 9, MFT Route 31, $30,000; Sect. 18, MFT SA R 25, $5,000; surveys completed Sect. 10, SA Route 53, $20,000; Sect. 11, MFT Route 53, $15,000. A. Buck, supt. Co Roads and engr.

Ill., Decatur—Decatur Park Dist., Dec Club Bldg., plans completed 3 mi. bitumi road 20 ft. wide with concrete curb, gu with all necessary grading, drainage, Pa Park. $67,500. Financing not yet prov for.

Ill., Pinckneyville—City, plans compl concrete paving, widening to 36 in. mi., $20,000; preliminary plans under bituminous paving with concrete curb, gu 4 mi., $25,000. Financing not yet prov for. Decatur Engineering Service Co., catur Club Bldg., Decatur, consult. engr

★**Ill., Springfield**—Sangamon Co., R. ley, road supt. and engr., Spring plans 90% completed concrete paving mi. Sect. 33X, MFT, $250,000; plans completed Sect. 56 MFT from Mecha burg to South line of Sect. 33T 16 N. r 3 W of 3rd P.M., $55,000; imprv. 7.3 Sect. 30X, MFT, $158,000; 5.6 mi. Sect. MFT, $125,000; 0.5 mi. Sect. 54, M $11,000; 4 mi. Sect. 25R, MFT, $80,000; mi. Sect. 50, MFT, $92,000; 1 mi. c north and south through west half of S 35, T. Range 4 W. of 3rd P.M. Sect. 49-1 MFT, $27,000; 8.1 mi. Sect. 31, M $133,000; 2.5 mi. Sect. 24, MFT, $42, 6 mi. Sect. 35 MFT from west line of Sa mon Ordinance, plant to Illiopolis, $9 oiling 7 mi. Sect. 54 MFT, $107,000; p 50% completed imprv. 3 mi. State Route 3B from north line of Sect. 2, T north Range, 3 in. of 3rd P.M. south Christian Co., incl. bridge over Sanga River, $217,000; 4.1 mi. State Aid Rout from Sect. 31 MFT to S.B.I. Route $92,000; plans 40% completed concrete ing 6 mi. State Aid Route 8, from Sect. MFT to Berlin, $19,000; imprv. 8 mi. S

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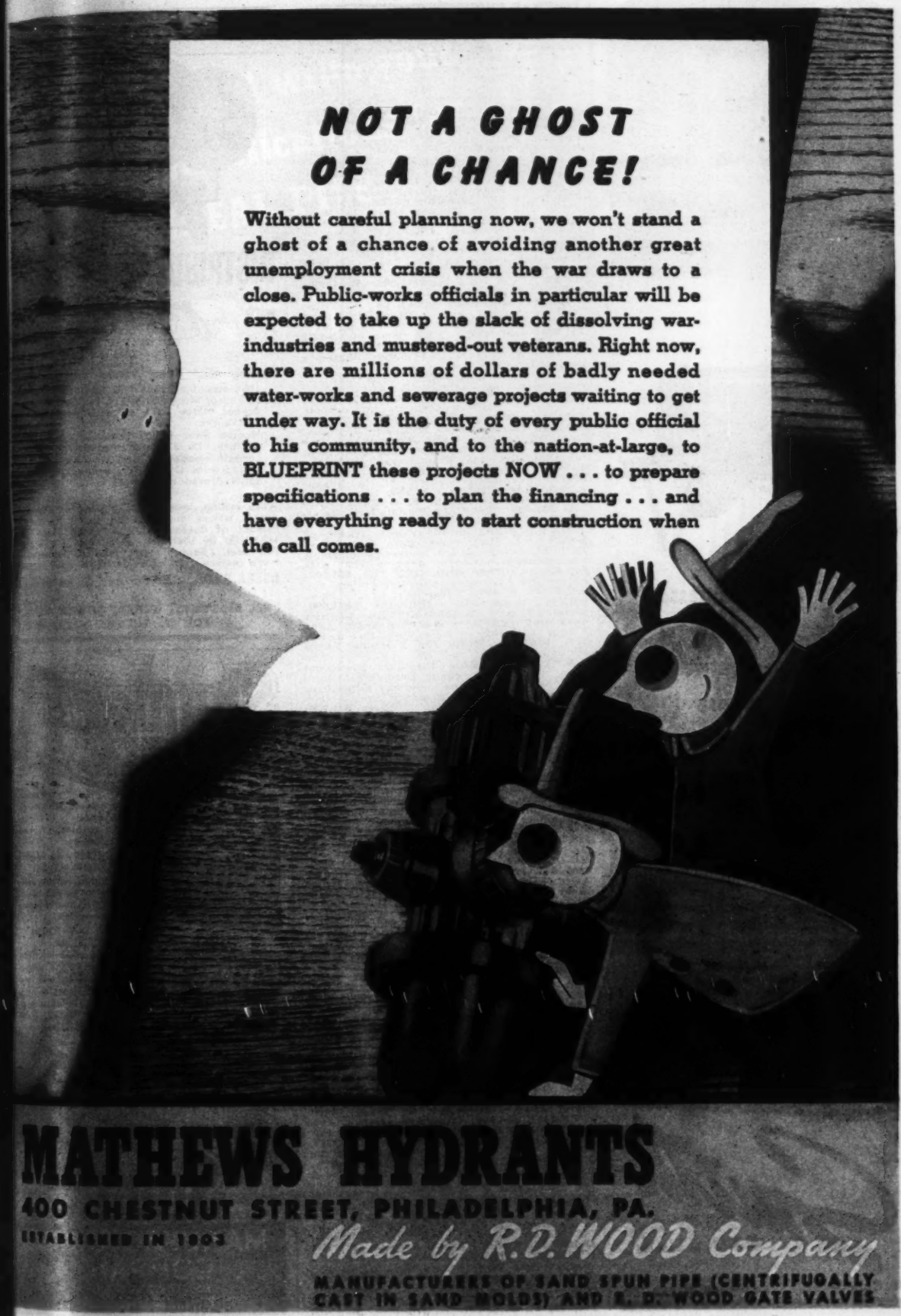
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Without careful planning now, we won't stand a ghost of a chance of avoiding another great unemployment crisis when the war draws to a close. Public-works officials in particular will be expected to take up the slack of dissolving war-industries and mustered-out veterans. Right now, there are millions of dollars of badly needed water-works and sewerage projects waiting to get under way. It is the duty of every public official to his community, and to the nation-at-large, to BLUEPRINT these projects NOW . . . to prepare specifications . . . to plan the financing . . . and have everything ready to start construction when the call comes.
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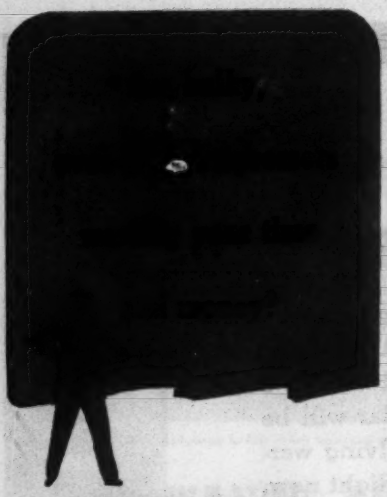

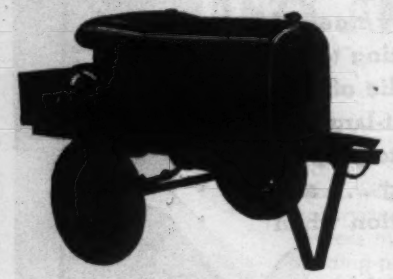

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POSTWAR PROJECTS (Cont'd.)

Aid Route 10 New Berlin to abandoned right of way of C & St. L. R. R., $357,000; 5.5 mi. State Aid Route 15, $114,000; plans 20% completed imprv. 11 mi. State Aid Route 8 from Springfield to Berlin except portion to be constructed by state as federal secondary project, $200,000; surveys and preliminary price estimate made imprv. 1.25 mi. State Aid Route 4, from Buchart to Christian Co. line, $25,000; State Aid Route 4A from Rochester to New City, $148,000; oiling 12.5 mi. State Aid Route 19 (proposed) from Pleasant Plains through Salisbury to S. A. Route 1A, $428,000; 4.5 mi. State Aid Route 2A from N.E. corner of S.E. quarter of Sect. 1.T. 17 N. Range 4W of 3rd P.M. south to Sect. 52, MFT. $57,000; 10.5 mi. State Aid Route 20 (proposed) from Thayer east to S.A. Route 5-C. $130,000; 4.5 mi. State Aid Route 5-C from Pawnee South to Montgomery Co. line, $56,000; 4.5 mi. State Aid Route 21 (proposed) from S.E. corner of Sect. 18 T. 16 N. Range 7W of 3rd P.M. West to Morgan Co. line, $42,000; 13 mi. State Aid Route 1A from Sect. 33 MFT east to S.E. corner of Sect. 27, T. 17N, Range 2 W of 3rd P.M., $145,000. Financing not yet provided.

Ill., Springfield—Sangamon Co., R. Tilley, road supt. and engr., Springfield, plans completed imprv. 1.6 mi. Sect. 37 G. MFT. $57,000; Sect. 48-3-1 MFT north and south through east half of Sect. 31, T. 16 N. Range 3 W of 3rd P.M. $110,000. Financing not yet provided.

Mich., River Rouge—City, plans underway concrete paving Coolidge Hy. with concrete curb, drainage, etc. $75,000. Mason L. Brown & Son, 120 Madison Ave., Detroit, consult. engr. and acting as city engr.

N. Y., Charleston — President Richmond Boro, C. A. Hall, comr. Boro Wks., Boro Hall, St. George, plans underway bituminous macadam pavement Madsen Ave., Richmond Valley Rd. to Bascomb St., (PRS-49) $17,800; Pitney Ave., Gladwin St. to Bloomingdale Rd., (PRS-181) $6,750; Claypit Rd., Bloomingdale to Arthur Kills Rds., (PRS-128) $21,000. State Aid Planning Funds allotted.

N. Y., Eltingville—President Richmond Boro, C. A. Hall, comr. Boro Wks., Boro Hall, St. George, plans underway bituminous macadam pavement Arbutus Ave., Amboy Rd. to Hyland Blvd. (PRS-136), $34,200; Fabian St., Lorraine Ave. to Amboy Rd. (PRS-27), $8,550; Rensselaer Ave., Huguenot to Arden Aves. (PRS-189), $21,600; Richmond Ave., Arthur Kill Rd. to New York Bay (PRS-67), $140,000; Arden Ave., Arthur Kill Rd. to New York Bay (PRS-238), $160,000. State Aid Planning Funds allotted.

N. Y., Great Kills—President Richmond Boro, C. A. Hall, comr. Boro Wks., Boro Hall, St. George, plans underway bituminous macadam pavement Armstrong Ave., Amboy Rd. to New York Bay, (PRS-4) $24,750; Dewey Ave., Corbin to Colon Aves., (PRS-20) $17,100; Hillside Terrace, Amboy Rd. to Hylan Blvd., (PRS-165) $17,200; Nelson Ave., Amboy Rd. to Hylan Blvd., (PRS-55) $15,400; Robinson Ave., Hylan Blvd. to Old Amboy Rd., (PRS-69) $43,400. State Aid Planning Funds allotted.

N. Y., Midland Beach—President, Richmond Boro, C. A. Hall, comr. Boro Wks., Boro Hall, St. George, plans underway bituminous macadam pavement Freeborn St., Miller Field to Hunter Ave., (PRS-30) $23,000; Garretson Ave., Hylan Blvd. to Mason Ave., (PRS-33) $12,200; Kiswick St., Miller Field to Hunter Ave., (PRS-167) $27,200; Moreland St., Miller Field to Hunter Ave., (PRS-54) $11,250; Nugent Ave., Miller Field to Hunter Ave., (PRS-179) $27,400; Olympia Blvd., Miller Field to Hunter Ave., (PRS-61) $23,600; Slater Blvd., Hylan Blvd. to New York Bay, (PRS-77) $20,250. State Aid Planning Funds allotted.

★**N. Y., New Dorp**—President Richmond Boro, C. A. Hall, comr. Boro Wks., Boro Hall, St. George, plans underway bituminous macadam pavement Husson St., Midland to Jefferson Aves. (PRS-44), $19,400; Jacques Ave., Hyland Blvd. to Staten Island Rapid Transit R. R. (PRS-166), $11,250; Jefferson Ave., Hylan Blvd. to Richmond Rd. (PRS-45), $11,250; McKinley Ave., Richmond Rd. to End (PRS-172), $16,600; Medina Ave., Amboy Rd. to end (PRS-53), $19,500; Altamont St., Richmond Rd. to Dead End (PRS-2), $14,500; Bache Ave., Staten Island Rapid Transit R. R. to Hylan Blvd. (PRS-16), $21,600; Center St., Arthur Kill Rd. to Moore St. (PRS-16), $17,600; Clark Ave., Amboy Rd. to Tyson Court (PRS-144), $46,000; Cuba Ave., Isernia Ave. to New Dorp Lane (PRS-149), $12,600; Fox Lane, Mill Rd. to 2300 ft. east (PRS-31), $10,350; Geldner Ave., Richmond Rd. to Sidney Pl. (PRS-157), $10,600; Greeley Ave., Staten Island Rapid Transit R. R. to Baden Pl. (PRS-34), $48,600; Hamden Ave., Walnut St. to Boundary Ave. (PRS-36), $29,000; Hunter Ave., Hylan Blvd. to Richmond Rd. (PRS-43), $29,000; Dale Ave., Amboy Rd. to Dorothea Pl. (PRS-13), $11,000; Dorothy Pl., Bishop St. to Richmond Rd. (PRS-33), $5,400; Ebbitts St., Roma Ave. to Mill Rd. (PRS-151), $21,000; Edison St., Bedford Ave. to New Dorp Lane (PRS-25), $40,400; Eighth St., New Dorp Lane to New York Bay (PRS-153), $14,000; St. George Rd., Rockland to Lighthouse Aves. (PRS-195), $40,200; St. Stephens Pl., Altamont to Odin

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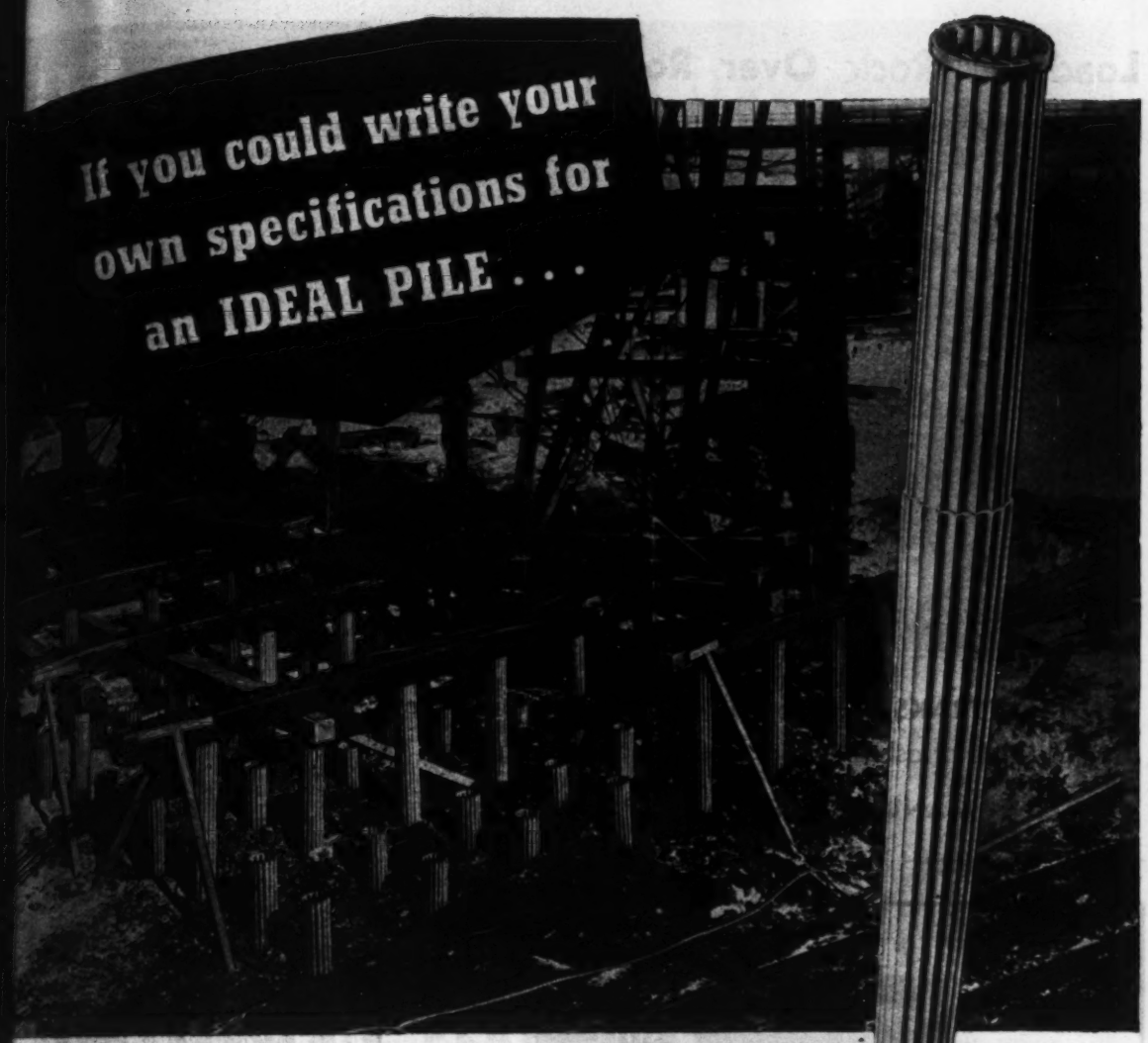

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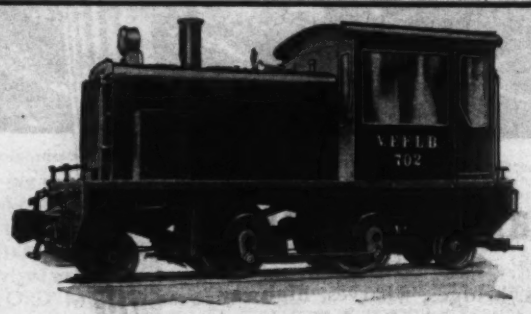

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POSTWAR PROJECTS (Cont'd.)

Sts. (PRS-74), **$12,800**; South Railroad Ave., New Dorp Lane to Beach Ave. (PRS-71), **$14,000**; Titus Ave., Isermia Ave. to New Dorp Lane (PRS-201), **$12,600**; Melson Ave., Rockland Ave. to Richmond Rd. (PRS-227), **$65,000**; Prescott Ave., South Railroad Ave. to Hylan Blvd. (PRS-104), **$21,000**; Roma Ave., Marine Way to Ebbitt St. (PRS-193), **$5,000**; Rose Ave., 10 St. to Hylan Blvd. (PRS-70), **$21,000**; Rose Ave., First St. to Hylan Blvd. (PRS-71), **$21,000**; St. Andrews Rd., Richmond Hill Rd. to Rockland Ave. (PRS-194), **$26,100**; Nevada Ave., Rockland Ave. to End (PRS-175), **$11,800**; Ninth St., New Dorp Lane to Beach (PRS-57), **$14,200**; North Railroad Ave., Lincoln to Delaware Aves. (PRS-54), **$45,000**; Nugent St., Rockland Ave. to End (PRS-178), **$20,000**; widening, paving Richmond Ave., Victory Blvd. to Rockland Ave. (PRS-234), **$190,000**; Richmond Ave., Rockland Ave. to Richmond Hill Rd. (PRS-235), **$180,000**; paving Richmond Hill Rd., Richmond Ave. to Arthur Kill Rd. (PRS-236), **$74,200**; paving bridge Meissner Ave., Rockland Ave. (PRS-130), **$35,000**. State Aid Planning Funds allotted.

★**N. Y., New York**—President Manhattan Boro, W. D. Binger, comr. Boro Wks., Municipal Bldg., Zone 17, plans underway repaving 185 St., Wadsworth Ave. to Bway. (PMS-402), **$7,875**; 201 St., 9 Ave. to Academy St. (PMS-404), **$9,517**; 207 St., 10 to Seaman Aves. (PMS-405), **$26,415**; 215 St., Harlem River to Bway. (PMS-406), **$35,100**; 216 St., 432 ft. East of 9 Ave. to Bway. (PMS-407), **$16,945**; 164 St., St. Nicholas Ave. to Bway. (PMS-395), **$5,310**; 170 St., Bway. to Ft. Washington Ave. (PMS-397), **$14,265**; 171 St., Bway. to Fort Washington Ave. (PMS-398), **$8,010**; 172 St., Amsterdam to Audubon Aves. (PMS-399), **$5,850**; 173 St., Audubon Ave. to Bway. (PMS-400), **$11,430**; 180 St., Audubon to Haven Aves. (PMS-401), **$35,400**; 106 St., Central Park West to Bway. (PMS-385), **$16,200**; 110 St., 5 to 8 Aves. (PMS-386), **$20,000**; 111 St., 5 to Manhattan Aves. (PMS-387), **$5,875**; 165 St., Bway. to Riverside Dr. (PMS-393), **$12,330**; 166 St., Amsterdam Ave. to Bway. (PMS-393), **$11,925**; 169 St., Amsterdam Ave. to Bway. (PMS-394), **$11,925**; 147 St., Convent to Amsterdam Aves. (PMS-377), **$5,490**; 127 St., Lenox to 7 Aves. (PMS-378), **$11,250**; 95 St., Park to 2 Aves. (PMS-381), **$22,050**; 98 St., Amsterdam Ave. to Bway. (PMS-382), **$5,265**; 99 St., Bway. to West End Ave. (PMS-383), **$5,175**; 102 St., 3 to Lexington Aves. (PMS-384), **$6,727**; 121 St., Morningside Dr. to Amsterdam Ave. (PMS-362), **$6,120**; 124 St., 3 to Lexington Aves. (PMS-364), **$7,110**; 129 St., St. Nicholas Terrace to Convent Ave. (PMS-366), **$7,740**; 130 St., St. Nicholas Terrace to Convent Ave. (PMS-367), **$9,292**; 135 St., Amsterdam Ave. to Bway. (PMS-368), **$24,300**; 136 St., Convent to Amsterdam Aves. (PMS-369), **$5,737**; 72 St., West End Ave. to Riverside Dr. (PMS-354), **$6,580**; 77 St., Cherokee Pl. to York Ave. (PMS-356), **$6,075**; 79 St., Amsterdam to West End Aves. (PMS-357), **$21,870**; 80 St., Columbus to Amsterdam Aves. (PMS-358), **$13,005**; 83 St., York to 1 Aves. (PMS-359), **$32,625**; 116 St., Madison to Manhattan Aves. (PMS-360), **$73,800**; 46 St., East River Dr. to 1 Ave. (PMS-340), **$6,975**; 40 St., 9 to 10 Aves. (PMS-341), **$12,937**; 43 St., 1 to 2 Aves. (PMS-343), **$13,140**; 46 St., Madison to 6 Aves. (PMS-346), **$6,325**; 61 St., Amsterdam to West End Aves. (PMS-350), **$12,577**; 61 St., Central Park West to Columbus Ave. (PMS-351), **$10,980**; 26 St., 5 to 7 Aves. (PMS-328), **$7,369**; 26 St., 10 to 11 Aves. (PMS-329), **$11,000**; 34 St., Park to 8 Aves. (PMS-334), **$17,428**; 34 St., 275 ft. west 11 Ave. to 12 Ave. (PMS-335), **$15,750**; 36 St., Park to Madison Aves. (PMS-337), **$6,435**; 39 St., 11 to 12 Aves. (PMS-339), **$11,800**. State Aid Planning Funds allotted. D. G. Edwards, ch. engr.

★**N. Y., New York**—President Manhattan Boro, W. D. Binger, comr. Boro Wks., Municipal Bldg. Zone 7, plans 35% completed Harlem River Drive from E. 125 St. to 2nd Ave., incl. bulkheads. (PRS-65) **$2,966,000**; plans 75% completed Central Park Transverse Roadway approaches. (PM-49) **$579,000**. D. G. Edwards, ch. engr.

★**N. Y., New York**—President Manhattan Boro, W. D. Binger, comr. Boro Wks., Municipal Bldg., Zone 7, plans 90% completed trucking route exten. of 1st Ave. through Pike St. (PM-54). **$1,200,000**. D. G. Edwards, ch. engr. CD 3/11/43—ENR 3/18/43.

★**N. Y., New York**—President Manhattan Boro, W. D. Binger, chn. Boro Wks., Municipal Bldg., Zone 7, connection between Washington Heights and The Bronx. (PM-80), **$500,000**; West Side Elevated Hy. reconstruction, Gansevoort St., 23 to 60 Sts. (PM-53), **$1,100,000**; hy. connection between East River Drive Exten. and Brooklyn Bridge and adjoining business area, (FS-1), **$1,000,000**; preliminary studies completed Manhattan Crosstown Routes (PM-52), **$40,000,000**; Lower Manhattan Crosstown Express Hy. (PM-66), **$25,000,000**. D. G. Edwards, ch. engr.

★**N. Y., New York**—President Manhattan Boro, W. D. Binger, comr. Boro Wks., Municipal Bldg., Zone 7, in conjunction with Dpt. P. Wks., Queensboro Bridge approach street changes and widening (PM-49), **$2,000,000**. D. G. Edwards, ch. engr. CD 9/2/43—ENR 9/30/43.

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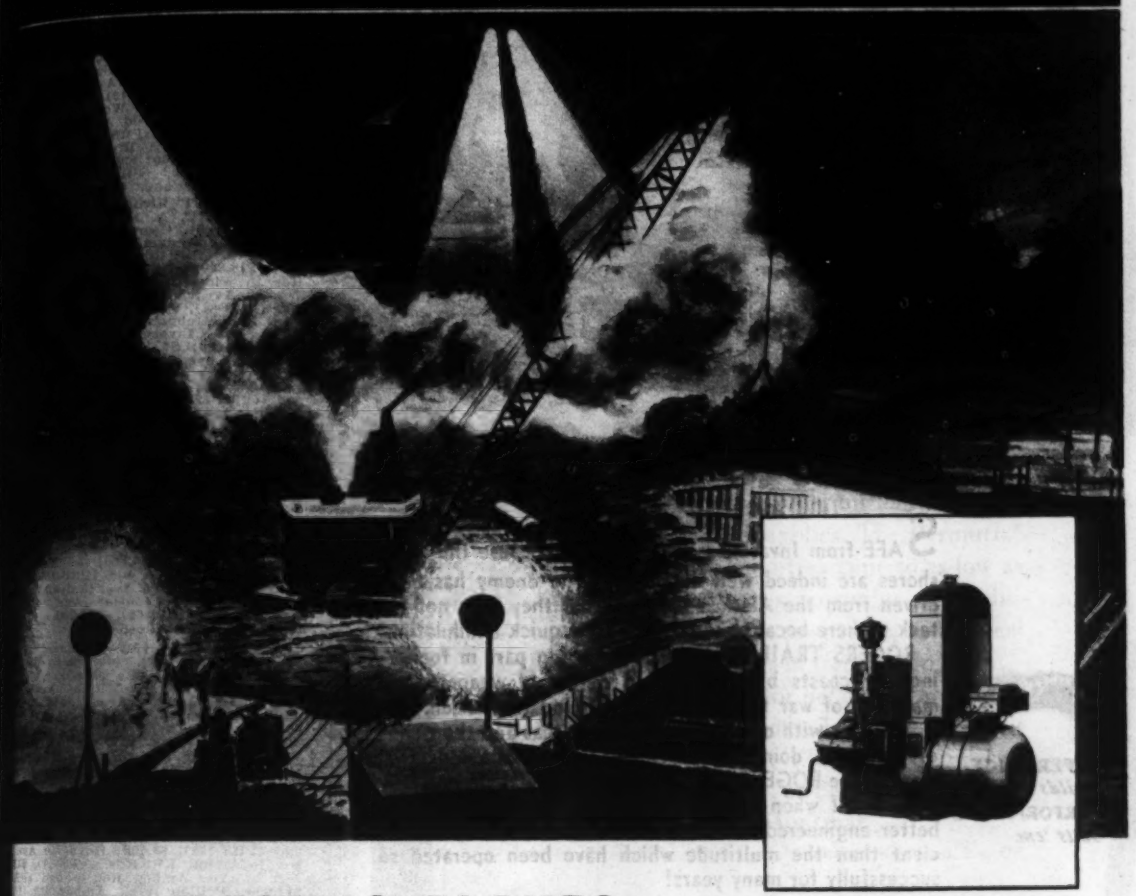

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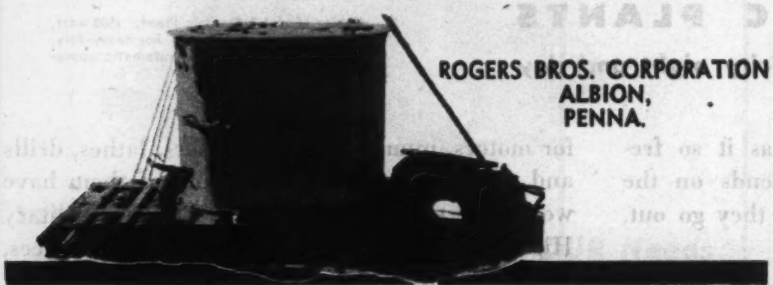

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POSTWAR PROJECTS (Cont'd.)

N. Y., Port Richmond — President Ri... mond Boro, C. A. Hall, comr. Boro Wk... Boro Hall, St. George, plans underw... bituminous macadam pavement Arth... Ave., Victory Blvd. to Westwood A... (PRS-3), $25,000; Auburn Ave., Crystal A... to Woodbine St., (PRS-137), $2... Brabant St., Union to South Aves., (PR... 11), $22,000; Bryson Ave., Victory Blvd. ... Watchogue Rd., (PRS-140), $25,000; Case... Ave., Crystal Ave. to Willowbrook Rd., (PR... 142), $14,100; Caswell Ave., Watchogue R... to dead end, (PRS-143), $43,200; Cierna... Pl., Victory Blvd. to Westwood Ave., (PR... 146), $25,300; Callfield Ave., Watchogue R... to Victory Blvd., (PRS-147), $27,200; C... tal Ave., Victory Blvd. to Forest A... (PRS-148), $62,000; Egbert Ave., Manor ... to Jewett Ave., (PRS-26), $20,800. St... Aid Planning Funds allotted.

N. Y., Port Richmond—President Ri... mond Boro, C. A. Hall, comr. Boro Wk... Boro Hall, St. George, plans underway ... tuminous macadam pavement Willowbr... Rd., Forest Hill Rd. to Fillmore Ave., (PR... 204), $18,800; Willowbrook Rd., Forest H... Rd. to Victory Blvd. (PRS-205), $23,0... Wooley Ave., Victory Blvd. to Willowbr... Rd. (PRS-84), $35,800; Wooley Ave., Colo... Ave. to Watchogue Rd. (PRS-85), $18,... North Ave., Livermore Ave. to end (PR... 176), $17,400; St. John's Ave., Bay St. ... Tompkins Ave. (PRS-196), $17,000; Sherm... Ave., Victory Blvd. to Westwood Ave (PR... 197), $23,800; Summers Ave., Carter Ave. ... end (PRS-198), $33,800; Wellbrooke Ave... Brielle Ave. to end (PRS-202), $20,... Lathrop Ave., Crystal to Willowbrooke ... (PRS-46), $12,800; Latimer Ave., Bra... Blvd. to dead end (PRS-163), $14,... Livingston Ave., Brielle Ave. to dead-... (PRS-169), $27,800; Martin Ave., Victo... Blvd. to Westwood Ave. (PRS-171), $23,... Morgan Ave., Garrison to Burgher Ave... (PRS-173), $18,800; Forest Hill Rd., W... lowbrook to Old Mill Rds. (PRS-1... $38,500; Gannon Ave., Woodward to Bra... Aves. (PRS-156), $33,800; Grafton Ave., V... tory Blvd. to dead end (PRS-159), $12,... Groves Ave., Brielle Ave. to dead end (PR... 160), $27,200; Greenleaf Ave., Marion ... Egbert Sts. (PRS-35), $15,200. State A... Planning Funds allotted.

★**N. Y., Prince's Bay**—President Richm... Boro, C. A. Hall, comr. Boro Wks., B... Hall, St. George, plans underway bitumin... macadam pavement Vernon Ave., Amb... Rd., north to end (PRS-81), $26,200; Wo... vail Ave., Amboy Rd. to Beach (PRS-2... $51,000; Princewood Ave., Vernon Ave. ... Maderia St. (PRS-185), $15,200; Purdy ... Woodward to Sheraden Aves. (PRS-18... $18,200; Rossville Ave., Woodrow to Arth... Kill Rds. (PRS-72), $24,750; Sequine Ave... Hylan Blvd. to Staten Island Rapid Tra... R. R. (PRS-75), $26,200; Sharrott Ave... Latourette St. to Butler Ave. (PRS-1... $35,800; Hanover Ave., Sequine Ave. to d... end (PRS-162), $5,400; Huguenot Ave., ... boy to Arthur Kill Rds. (PRS-41), $170,... Manee Ave., Amboy Rd. to end (PRS-... $11,000; Poillon Ave., Amboy Rd. to ... York Bay (PRS-182), $64,000; Prall Ave... Amboy Rd. to 2,300 ft. south (PRS-1... $10,350; Bayview Ave., Amboy Rd. to ... York Bay (PRS-8), $51,400; Bedell St., ... boy Rd. to Hylan Blvd. (PRS-133), $23,... Carlton Ave., Huguenot Ave. to Foster ... (PRS-141), $32,000; Edgegrove Ave., ... turn to Arden Aves. (PRS-152), $45,... Finley Ave., Woodvale to Bayview ... (PRS-154), $12,800. State Aid Plann... funds allotted.

★**N. Y., Rosebank**—President Richm... Boro, C. A. Hall, comr. Boro Wks. ... George, plans underway bituminous ... cadam pavement Raritan Ave., Richm... Rd. to Staten Island Rapid Transit R... (PRS-187), $19,800; Reid Ave., Norway ... to westerly end, (PRS-188), $30,000; Ba... Rd., Indian Ave. to Sand Lane, (PRS-... $14,600; Rome Ave., Richmond to Pla... board Rds., (PRS-192), $11,000; Todt ...

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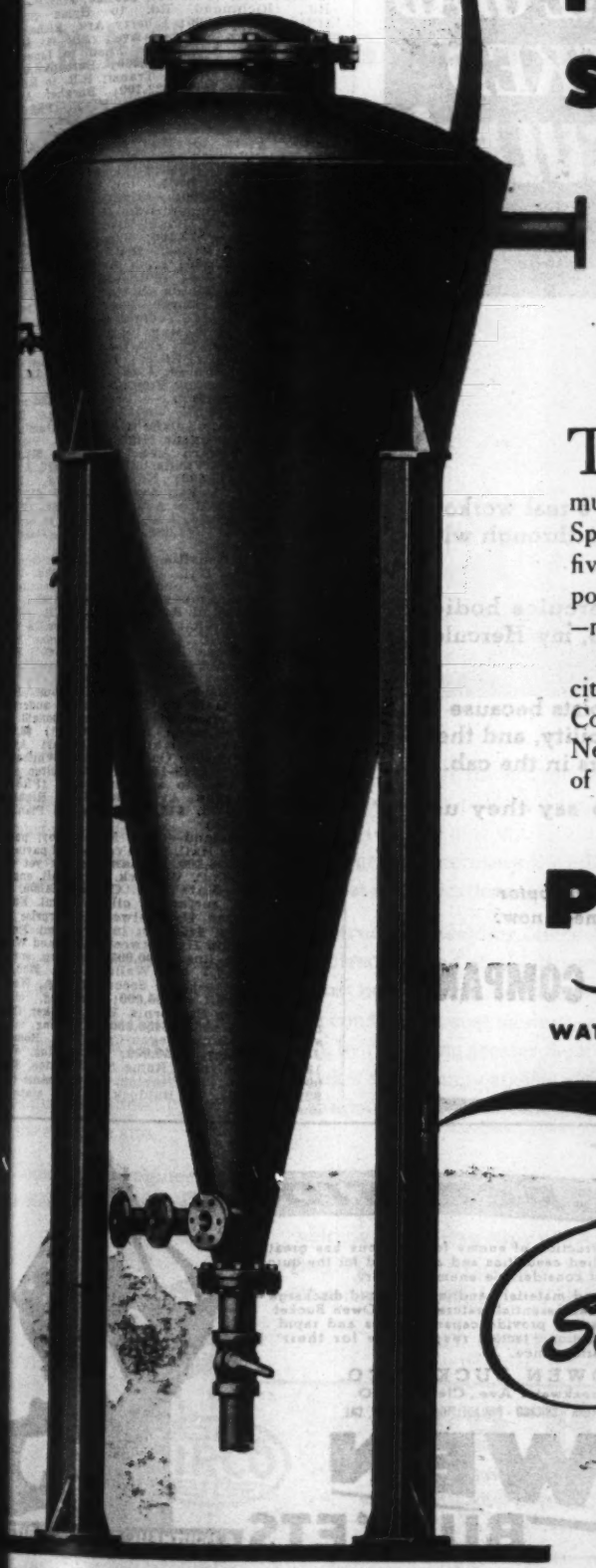

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POSTWAR PROJECTS (Cont'd.)

Rd., Ocean Terrace to Richmond Rd. (PRS-131), $85,000; Mason St., Vista to Sparkill Aves., (PRS-52), $5,800; Old Town Rd., Richmond Rd. to Hylan Blvd., (PRS-58) $18,400; Olympia Blvd., Sand Lane to Nor-way Ave., (PRS-62), $25,600; Parkinson Ave., Marie St. to Cameron Pl., (PRS-63) $39,200; Radcliffe Rd., Allendale to Fingerboard Rds., (PRS-66), $9,450; Delaware St., Dalemore Rd. to New York Bay, (PRS-154) $39,600; Dongan Hills Ave., Richmond Rd. to dead end, (PRS-22), $10,500; Fingerboard Rd., Richmond Rd. to Hylan Blvd. (PRS-23), $27,000; Liberty Ave., Richmond Rd. to North Railroad Ave., (PRS-48), $14,000; Major Ave., Lily Pond to Linwood Aves., (PRS-170), $26,200; Burbank Ave., Staten Island Rapid Transit R.R. to Miller Field, (PRS-14), $22,700; Burgher Ave., Richmond Rd. to Hylan Blvd., (PRS-15) $28,800; Clawson St., Midland Ave. to New Dorp Lane, (PRS-145), $34,200; Colony Ave., Miller Field to Hunter Ave., (PRS-17) $23,700; Clawson St., New Dorp Lane to Lindbergh Ave., (PRS-18), $17,000; Adam Ave., Hylan Blvd. to Richmond Rd. (PRS-1), $28,000; Atlantic Ave., Hylan Blvd. to Richmond Rd., (PRS-5), $30,000; Bedford Ave., Hylan Blvd. to Richmond Rd. (PRS-9), $23,400; Bryant Ave., Staten Island Rapid Transit R.R. to Miller Field (PRS-12), $22,250; Buell Ave., Hylan Blvd. to Richmond Rd., (PRS-13), $32,200. State Aid Planning Funds allotted.

N. Y., St. George—President Richmond Boro, C. A. Hall, comr. Boro Wks., Boro Hall, plans underway bituminous macadam pavement Fort Pl., Sherman Ave. to Dean Law Terrace, (PRS-29) $19,200; Lawrence Ave., Bard to Forest Aves., (PRS-47) $31,000. State Aid Planning Funds allotted.

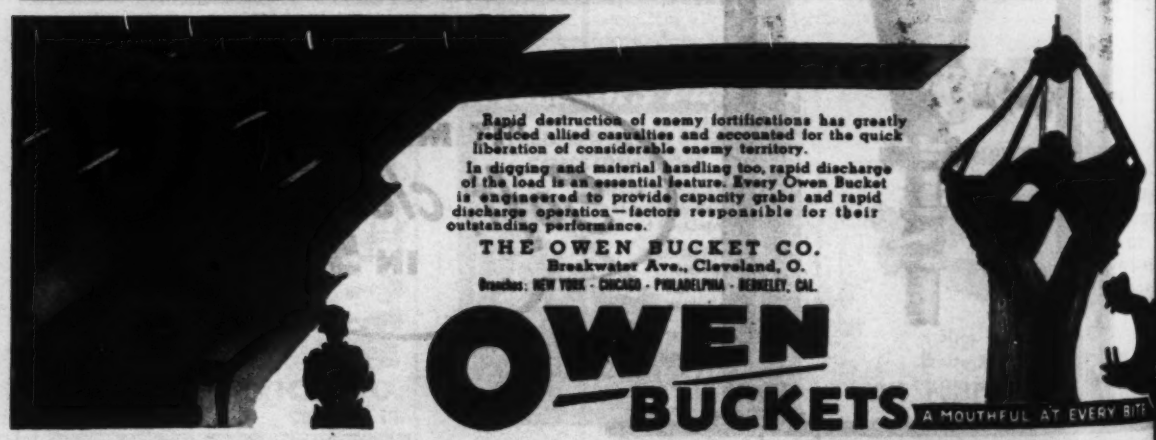
N. Y., Stapleton — President Richmond Boro, C. A. Hall, comr. Boro Wks., Boro Hall, St. George, plans underway bituminous macadam pavement Highland Ave., Victory Blvd. to Howard Ave., (PRS-164) $17,800; Hillside Ave., Vanderbilt to Howard Aves., (PRS-39) $13,500; Northern Blvd., Little Clove Rd. to LeBau Ave., (PRS-177) $16,000; Rhine Ave., Baltic Ave. to Mary St., (PRS-190) $11,250; Tioga St., Clove Rd. to Seneca St., (PRS-200) $7,600. State Aid Planning Funds allotted.

N. Y., Tottenville — President Richmond Boro, C. A. Hall, comr. Boro Wks., Boro Hall, St. George, plans underway bituminous macadam pavement Bethel Ave., Amboy Rd. to Staten Island Rapid Transit R.R., (PRS-10) $6,750; Brehaut Ave., Craig Ave. to Totten-man St., (PRS-139) $10,350; Yetman Ave., Hylan Blvd. to Surf Ave., (PRS-207) $[illegible],200. State Aid Planning Funds allotted.

N. Y., West New Brighton — President Richmond Boro., C. A. Hall, comr. Boro Wks., Boro Hall, St. George, plans underway bituminous macadam pavement Donald Pl., Walnut to Linden Sts., (PRS-21) $4,5[illegible] Harvest Ave., Oakland to Hart Aves., (PRS-33) $12,400; Oakland Ave., Whitewood Ave. to end, (PRS-120) $10,800; Pelton Ave., Castleton Ave. to southerly end, (PRS-[illegible]) $40,000; Rugby Ave., Grand to Highland Aves., (PRS-73) $13,500. State Aid Planning Funds allotted.

★**O., Cleveland**—City, Frank Foy, purch. agt., City Hall, plans completed paving [illegible] streets, $2,096,300. Financing not yet pro-vided for. J. C. Wenrick, City Hall, engr.

★**Oregon**—State Hy. Comn., Salem, [illegible] grading, surfacing, oiling 22 mi. Enter-prise-Lewiston Hy. between Enterprise and Sled Springs, $450,000; imprv. 9 mi. Enter-prise-Lewiston Hy. between Flora and Wash-ington state line, $300,000; grading, surfac-ing, oiling 7.8 mi. Wallowa Hy., $250,000; 12 mi. Weston-Elgin Secondary Hy., West to McDougall, $236,000; grading, oiling Idaho-Oregon-California Hy., Hooker Creek to Malloy Ranch, $450,000; widening, oiling, surfacing Idaho-Oregon-Calif. Hy., Rome to Jordan Valley, $350,000; resurfacing, oiling 12 mi. same road, Rome to Princeton, $2[illegible],000; grading, resurfacing, 12 mi. same road, $210,000. R. H. Baldock, Salem, state highway engr.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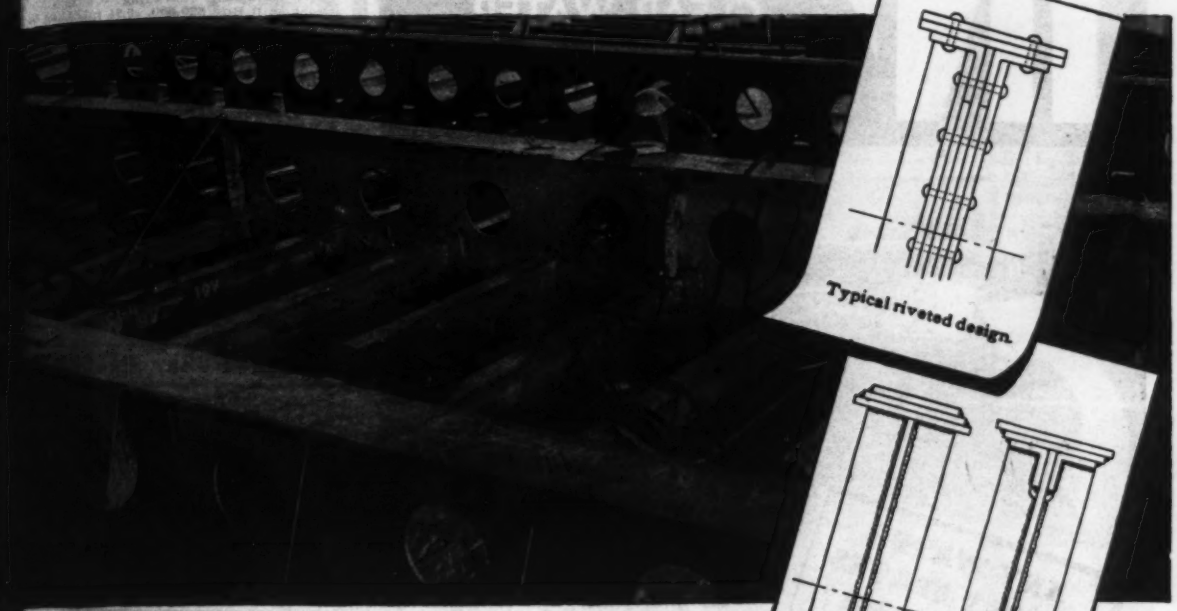
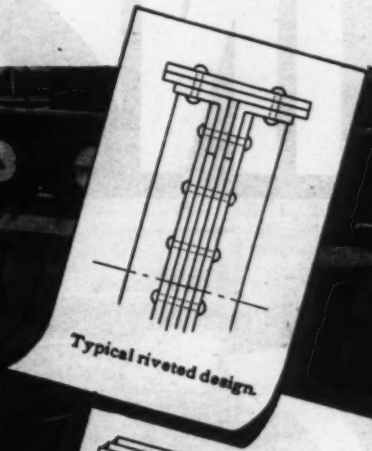
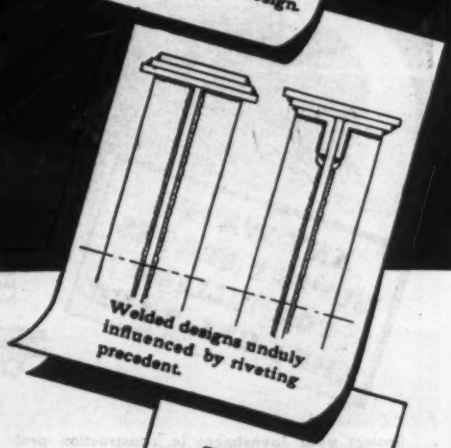
SIMPLICITY IS THE KEYNOTE OF WELDED DESIGN

...in buildings as well as ships

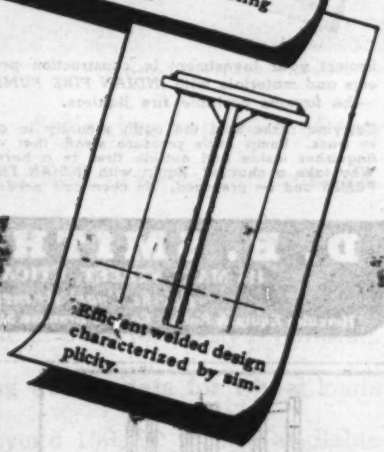




Typical riveted design.



Welded designs unduly influenced by riveting precedent.



Efficient welded design characterized by simplicity.

Modern structural welding eliminates many of the complex details necessary with older steel-joining methods. This point is clearly illustrated in the sketches shown at right. Note the extreme simplicity of the welded design — simplicity which greatly increases the efficiency of the welded joint and reduces the cost of fabrication.

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Contractors, engineers, and steel fabricators are invited to call upon Air Reduction for assistance in working out problems of structural welding. For a free copy of "Arc and Gas Welding Symbols," write to Department EN, New York office.

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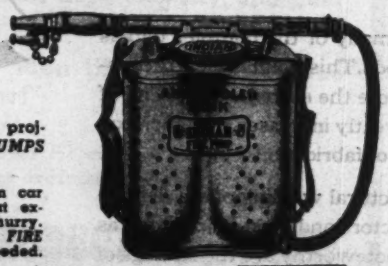

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POSTWAR PROJECTS (Cont'd.)

★**R. I., Newport**—City, P. Wks. Dpt., City Hall, imprv. various streets, incl. walks, curbing, **$700,000.** Charles A. Maguire & Assoc., 1515 Turks Head Bldg., Providence, consult. engrs.

Tex., Liberty—City, c/o T. N. McClendon, mayor, City Hall, plans underway paving and drainage, **$90,000.** Garrett Engineering Co., 1806 Milam St., Houston, consult. engr.

Wash., Everett — Snohomish Co., Court House, plans underway grading, surfacing, draining 2.8 mi. Fire Trail Rd. to Lake Shoecraft, **$35,000;** clearing, grubbing, grading, surfacing, drainage 1 mi. Cedar Way south, **$19,000;** regrading 4.7 mi. Woods Creek Hill Rd., **$20,000.** 2.95 mi. Lake Goodwin Rd., **$35,000;** widening Hall's Lake, Edmonds R.1., **$7,500.** C. E. Hickey, County house, co. engr.

READY FOR BIDS.

Ill., Decatur—Bd. Supervs. Macon Co., plans completed Sect. 3, MFT SA Route 28, **$95,000;** Sect. 4, MFT SA Route 2[illegible], **$20,000;** Sect. 5, MFT SA Route 19, **$30,000;** Sect. 6, MFT SA Route 30, **$20,000;** Sect. 7, MFT SA Route 24, **$20,000.** A. Bacon, supt. County Roads and engr.

★**N. Y., New York**—President Manhattan Boro, W. D. Binger, comr. Boro Wks., Municipal Bldg., Zone 7, plans complete East River Drive from 92 to 99 Sts., and 96 St. Overpass, (PM-63). **$2,502,000.** G. Edwards, ch. engr.

CONTRACTS AWARDED

Ont., Stratford—Perth Co., Stratford, grading 146 mi. roads, day labor, **$258,000.** C. Bates, County Bldg., engr. CD 11/[illegible] ENR 11/11.

EARTHWORK, WATERWAYS

PLANS UNDERWAY

★**O., Cleveland** — City, S. F. David, dir. Pub. Service, City Hall, plans 25% completed Cuyahoga River Imprvt. Cut 4, **$1,410,000;** shore protection W. 117 St., West Blvd. and E. 72 to 185 Sts., (exclud. Bratenahl), **$400,000.** Financing not yet provided for. CD 12/10—ENR 12/16.

O., Cleveland—City, S. F. David, dir. Pub. Service, City Hall, plans 25% complete Main Ave. bridge pier protection, **$50,0**; Central Viaduct Pier removal and bulkhead constr. along Cuyahoga River, **$80,000.** Financing not yet provided for. J. C. Wear, 518 City Hall city engr.

LATIN-AMERICA

Chili—Republic of Chili, Minister of Pub. Wks. & Communications, Santiago, recreational facilities, incl. gyms, athletic courts, swimming pools, parks, etc. **$5,000,000,** housing cost housing **$25,000,000,** railroad construction, incl. extensions, completing unfinished sections lines, general rehabilitation of [illegible], **$35,000,000,** water facilities **$8,000,000,** highway work throughout Republic **$30,000,000,** irrigation **$40,000,000,** all at Santiago; harbor expan., imprvs., at **Arica, $12,500,000.**

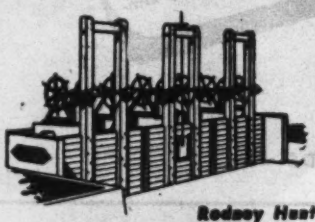
PUBLIC BUILDINGS

PROPOSED WORK

★**Idaho, Moscow**—University of Idaho, Moscow, H. C. Dale, pres., Home Ec., engineering, forestry-mining, agriculture, armory-fieldhouse bldgs., **$1,500,000.**

La., New Orleans—Dpt. P. Property, City Hall, imprv. municipal repairs plant, new office, **$17,340;** machine shop, **$11,[illegible]** automotive repair shop, **$31,800;** asphalt plant, **$31,800.**

★**Mich., Alpena**—Bd. Educ., Alpena, brick, steel, concrete Union School. **$575,0** Applied for State funds.



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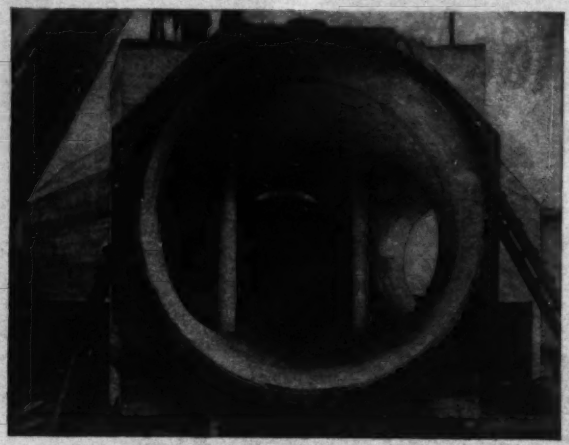

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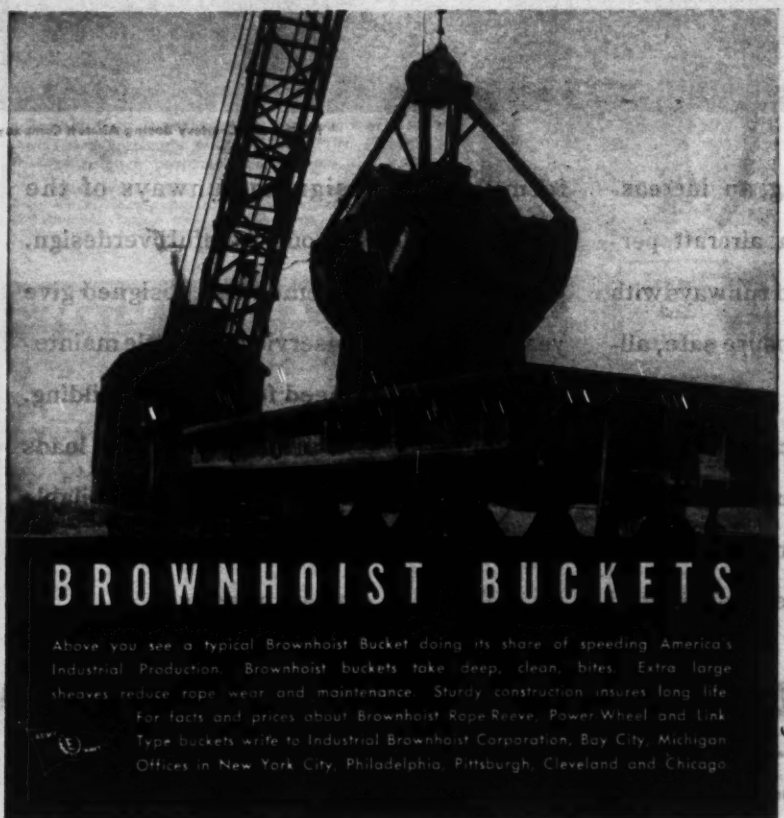

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POSTWAR PROJECTS (Cont'd.)

★**Mich., Detroit**—Wayne Co. Sheriff, Coun... ty Jail, new jail. $3,037,000.

Mich., Detroit—Wayne Co. Coroners Bu... St. and Lemay Ave., brick, steel, concre... coroners garage and shipping bldg. $54,...

Mich., Eloise—Wayne Co. infirmary, Eloi... central refrigerating plant providing bri... sys. pumped from central production pla... to replace present individual ammonia ... frigerating plants, $200,000; rewiring Secon... ary Power House Bldg. N. and miscella... ous imprvs., putting wiring in conduit... $20,000.

★**Mich., Eloise**—Wayne Co. Infirmary, El... oise, cafeteria, employees service bldg... post office and concession, incl. living qua... ters help and department heads, $450,... general and research laboratory, $650,... 4 story, bsmnt. hospital, $400,000; front ... tion of Seymour Hospital, fireproofing pa... of 4 story general hospital by replacing pre... ent wood and wood lathe with fire resistan... materials $150,000; tunnels and mechanic... exten. for purpose of connecting propos... bldg. program with existing facilities no... on grounds and to carry electric lines, pow... and steam lines with tops of tunnels servi... as walks and roadways, $50,000.

Mich., Mt. Clemens—Macomb Co., Coun... Bldg., infirmary for County institution... $250,000.

Mich., Mt. Pleasant—State, Central Mich... igan College, brick, steel, stone, concrete... Arts and Crafts Bldg. $350,000.

★**Mich., Northville**—Wayne Co. Training... School, Northville, 1 story training scho... addn. to Administrative bldg., $15,... 2 story kindergarten school, $43,000; 1 sto... Boys' Vocational Training School, $50,... altering Dormitories Cottages D and ... $35,000; practice house, $75,000; auditoriu... addn., and raising main roof increasing sea... ing capacity, $80,000; 1 story main servi... garage addn., $20,000.

Mich., Northville—Wayne Co. Trainin... School, Northville, 25 cottages for marri... employees, $100,000; 2 complete sets farm... stead bldgs., for practice teaching, $40,... 1 wing, 20x40 ft., greenhouse type conserv... tory for teaching Natural History, $7,... reconstructing public lighting (over-head... sys. in Institutions, driveways and ground...

Mich., Royal Oak—City, E. Shafter, cit... mgr., City Hall, city hall, $162,000. CD 1/1... ENR 8/24.

Mich., Wayne—Wayne Co. Agricultur... Exten. Service, Wayne, agricultural bld... incl. library, rural schools office, healt... headquarters, auditorium, committee room... kitchen, dining room. $350,000.

★**Minn., Rochester**—City, Bd. Educ., ... Cutshall, school comr., Senior Hi... School, $700,000; Junior High School, $60... 000; 2 grade bldgs., $150,000 each; 2 scho... addns. $1,850,000 bond election within ne... 2 months.

★**Mo., St. Louis**—City, M. M. Kin... pres. Bd. Pub. Serv., 304 City Ha... juvenile court and children's detention bld... Over $500,000, with equip.

N. H., Wilton—Town, Bd. Selectmen, Ty... Hall, garage and firehouse, Main St. Ov... $50,000. Financing not yet provided for.

★**N. J., Vineland**—Borough, Borough Ha... 2 or 3 story, brick veneer, concrete blo... municipal bldg., $300,000; electrical supp... plant, $300,000.

N. Y., Canton—Dpt. P. Wks., State Off... Bldg., Albany, Zone 1, home economics bld... at N. Y. State Agricultural & Technical In... stitute. $340,000.

N. Y., Fredonia—Dpt. P. Wks., State O... fice Bldg., Albany, Zone 1, heating plant ... State Teachers College. $200,000.

★**N. Y., Marcy**—Dpt. P. Wks., State O... fice Bldg., Albany, Zone 1, medical an... surgical bldg. Marcy State Hospital for Dy... Mental Hygiene. $1,200,000.

N. Y., Morrisville—Dpt. P. Wks., Sta... Office Bldg., Albany, Zone 1, gymnasium... heating plant, auditorium at N. Y. Sta... Agricultural & Technical Institute. $435,...

N. Y., Pittsford—Town, garage, $40,... State Aid Planning Funds allotted.

O., Fostoria—City, F. E. Blazer, ser. Dir... $120,000 bond election Nov. 7, war memori... bldg.

★**Tex., San Antonio**—University of Tex... Medical Branch, 912 Strand St., Ga... veston, 1,200 bed cap. main hospital, $3,... 000; nurses dormitory, $1,000,000; labor... tories, medical and dental classrooms bld... $1,000,000; chemistry laboratory, $600,... bio-chemistry bldg., $400,000; biology bld... $400,000; dental bldg., $500,000; pharma... bldg., $400,000, on 47-acre site near Ala... Stadium.

Va., Falls Church—Fairfax Co., W. ... Woodson, supt., Fairfax, preliminary pl... 3 story school, near here. $150,000 or m...

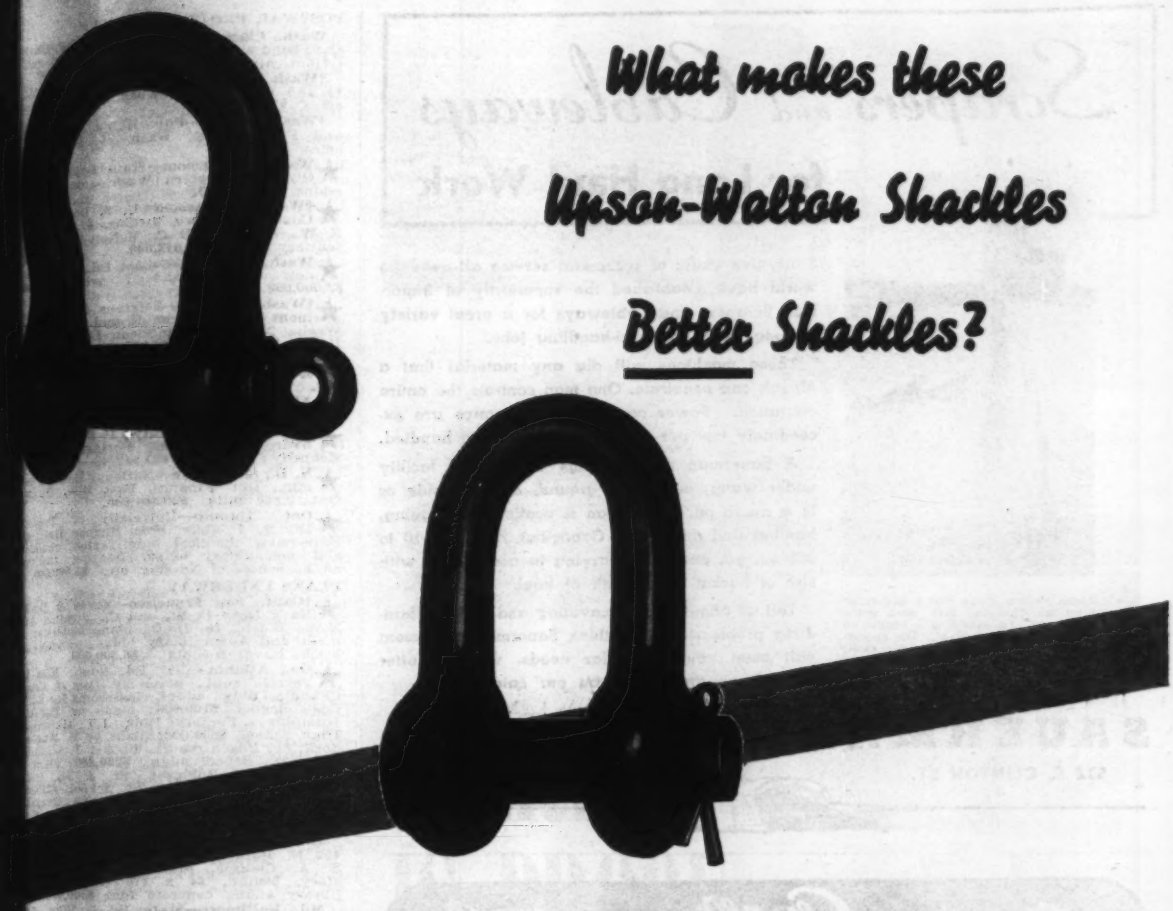
★**Va., Richmond**—City School Bd., Ir... stone Oak Grove School, vicinity pro... school at 2300 Ingram Ave., near Pet... burg Pike. $550,000.

Wash., Bellingham—City, City Hall ... brary. $290,000.

†**Wash., Cashmere**—Pub. Bldgs. Admin... 11 and F Sts. N.W., Wash. 25, D. C., ... office. $75,000.

†**Wash., Chelan**—Pub. Bldgs. Admin., ... and F Sts., N.W., Wash. 25, D. C., ... office. $70,000.

What makes these Upson-Walton Shackles Better Shackles?



THERE are two ways to make shackles. One way is to set up shop and make them. The other way—the Upson-Walton way—is to engineer them as carefully and as thoughtfully on the drawing board as if they were airplane engines—long before they go to shop.

Check these Upson-Walton shackle specifications. They are some indication of how we are able to produce shackles that give *maximum satisfaction in actual use.* Better shackles—and better buys!

Steel Specifications: Upson-Walton specifies only specially selected, fine grain, higher tensile steels. These steels have superior forging qualities—give a more uniform product capable of developing more strength.

All Shackles are made to rigid United States government specifications on spreads and clearances.

Made in Solid Dies: All shackles in sizes up to and including 1⅛ inches are drop forged on solid dies. This process requires more expensive tooling, but the additional cost is absorbed in volume production. Upson-Walton shackles cost no more, but they are all uniformly better shackles.

Control Inspection: All Upson-Walton shackles are inspected 3 separate times before shipping. First, as they come from trimming; second, before and after drilling and tapping; and third, final inspection before shipping.

Galvanized Threading: All galvanized screw pin shackles have galvanized pins and galvanized threads. Galvanizing is done after threading, so it is not cut off on Upson-Walton shackles.

Uniform Threads: All thread tolerances are closely held—tight and firm, yet easy to engage.

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These machines will dig any material that a plough can penetrate. One man controls the entire operation. Power cost and maintenance are exceedingly low per cubic yard of material handled.

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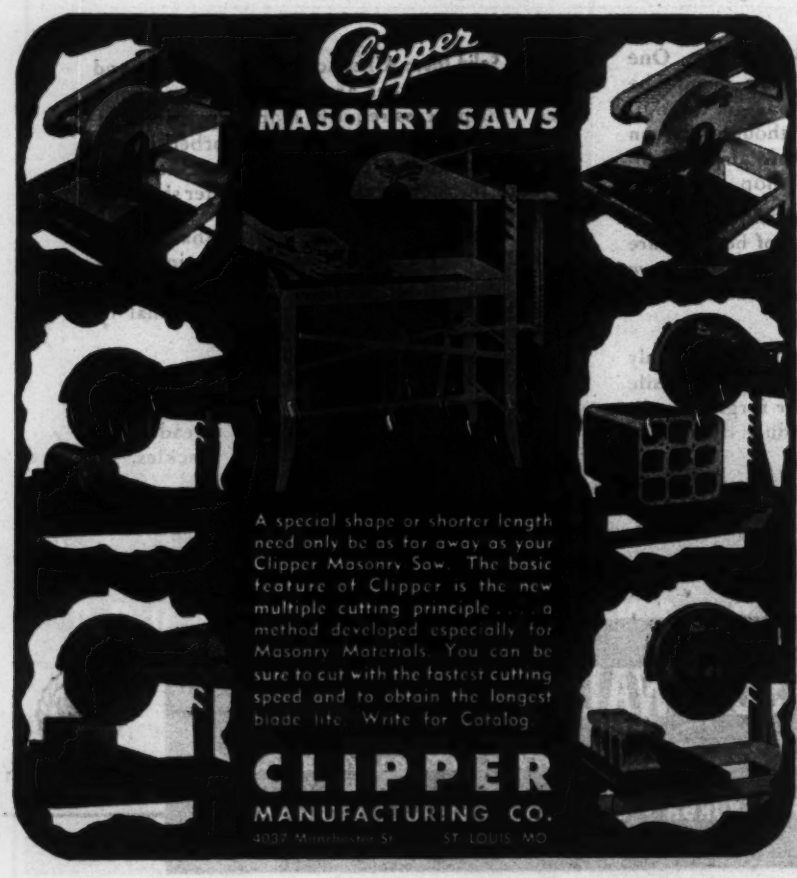
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POSTWAR PROJECTS (Cont'd.)

Wash., Clarkston—School Dist. 250, Clarkston, bond election Oct. 25, new school, auditorium, high school and gym. $400,000.

†**Wash., Mason City**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office. $75,000.

†**Wash., Omak**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office. $75,000.

★**Wash., Steilacoom**—State Dpt. Finance, Olympia, Western Washington Hospital addns. $2,000,000.

★†**Wash., Steilacoom**—U. S. Dpt. Justice, Constitution Ave. between 9 and 10 Sts. N. W., Wash., 25, D. C., McNeil Island Penitentiary addn. $3,018,000.

★**Wash., Tacoma**—School Bd., Tacoma, 9 new schools and 7 school addns. $2,000,000.

★†**Wash., Tacoma**—Veterans Admin., Vermont Ave. between H and I Sts. N.W., Wash., 25, D. C., American Lake Veterans Hospital Addn. $1,000,000.

★**Wis., Kenosha**—Bd. Vocational & Adult Ed., 1704 62 St., vocational school. $500,000.

★**Alta., Edmonton**—Municipality, exten. generating cap. of power plant. $1,250,000.

★**Man., Winnipeg**—City, H-E Comn., for hydro departments, Portage Ave. and Kennedy St. $500,000. CD 9/2/43—ENR 9/9/43

★**N. B., Saint John**—National Housing Admin., Dpt. Finance, East Blk., Ottawa, Ont., 5,200 units. $20,800,000.

★**Ont., Toronto**—University of Toronto, Dr. H. J. Cody, pres. Simcoe Hall, c/o University, chemical bldg., exten. chemical and mechanical bldgs. Banting Institute addn., School of Nursing, etc. $5,000,000.

PLANS UNDERWAY

★†**Calif., San Francisco**—Yards & Docks Navy Dpt., 18 St. and Constitution Ave. N.W., Wash., 25, D. C., plans underway 1 main and 6 subsidiary bldgs., concrete & brick, Naval Hospital. $6,500,000.

★**Ga., Atlanta**—City Bd. Educ., Miss Ira Jarrell, supt., plans by Ivey & Crook, Chandler Bldg., addnl. classrooms for El. & Cook School, $160,000; plans by Baril, Humphreys, Forsythe Bldg., J. C. Murphy Jr. High School, $600,000; plans by E. Wachendorff, 811 Peachtree St., Booker T. Washington High School addn., $250,000; plans by Arthur Neal Robinson, Sr. & Jr., Healey Grady Bldg., Williams St. School, $210,000; plans by J. Wilhoit, Mortgage Guarantee Bldg., 4 classrooms, auditorium, etc. to E. P. Connelly School, $110,000.

Ill., Decatur—City, Decatur Pub. Library, 457 N. Main St., plans 90% completed by S. A. Clausen, Standard Office Bldg., 3 story, bsmnt., 64 x 116 ft., brick main library addn., concrete fdn. $200,000.

Md., Baltimore—State, Bd. P. Wks., Annapolis, plans by Taylor & Fisher, 1012 N. Calvert St., expansion, imprv. Morgan State College, incl. gymnasium, completion power plant, service tunnels, water lines, lighting equip. $407,000.

Md., Baltimore—State, Inspector of Tobacco, Charles and Conway Sts., plans 10% completed by C. H. Hebrank, 20 E. Lexington St., tobacco warehouse alterations addns. $50,000. Crout, Snyder & Crandall, 20 E. Lexington St., structural engr. T. J. George, 105 E. Pleasant St., mech. engr. C. 6/7—ENR 6/15.

Md., Pikesville—State Police Dpt., Armory Bldg., plans underway by O. E. Adams, 11 N. Charles St., Baltimore, Confederate Soldiers Home property addns., alterations into Police Headquarters, barracks, warehouse, automobile shop and garage. $150,000.

Mass., Boston—Commonwealth of Massachusetts, Pub. Health, State House, plans completed by Curtain & Riley, 45 Newbury St., chronic patients hospital, brick, steel. Over $150,000. Land rights not cleared.

★**Mass., Salem**—City Planning Bd., City Hall, plans by A. C. Comey, 5 Boylston St., Cambridge, civic center bldg. and grounds. Over $500,000. Financing not yet provided for. E. Hans, c/o owner, consulting engr.

Mich., Ferndale—City, 21205 Woodward Ave., brick, stone, steel, concrete city hall, $300,000; plans underway brick, steel, concrete market, $50,000. J. F. Gibbs, 22 Woodward Ave., city mgr.

Mich., Hamtramck—City, 8540 Joseph Campau Ave., plans underway brick, steel, concrete garage, paving and other improvements for yard for Dpt. P. Wks. $155,000. I. M. Kopkowski, City Hall, city engr.

★**Mich., Hamtramck**—City Clerk, 8540 Joseph Campau Ave., preliminary plans underway, brick, steel, stone, concrete municipal hospital and health center addn., $500,000; municipal bldg. and library, $757,000; veteran's memorial and recreation bldg., $888,000. I. M. Kopkowski, 8540 Joseph Campau Ave., engr.

★**Mich., Mt. Pleasant**—State, Central Michigan College of Educ., Mt. Pleasant, plans by R. Allen, 1024 Grand Rapids National Bank Bldg., Grand Rapids, brick, steel, concrete field house at college ground, $350,000; brick, steel, concrete school, $000; brick, steel, concrete science building alterations, $100,000; brick, steel, concrete school addn. $100,000.

POSTWAR PROJECTS (Cont'd.)

Mich., Wyandotte—City, 2 story, 100 x 120 ft., brick, steel, concrete community center [illegible], $218,000; plans underway brick, steel, [illegible] reinforced concrete. Junior High School addn., [illegible]. F. W. Liddle, City Hall, city [illegible]. CD 1/17—ENR 3/9.

N. Y., Buffalo—City, N. L. Nussbaumer, [illegible] comr. P. Wks., City Hall, public library, $3,000,000, G. Goetz, bldg. dir.; School [illegible] and School 24 addn. $1,270,000; South [illegible] High School $1,750,000, W. G. Seyffer, City Hall, managing engr. Land rights not cleared. CD 11/15—ENR 11/18.

N. Y., Buffalo—City, N. L. Nussbaumer, Comr. P. Wks., City Hall, plans completed School 40 and School 73 addn. $1,270,000. W. G. Seyffer, Land rights not cleared. W. G. Seyffer, City Hall, managing engr. CD 11/15 —ENR 11/18.

N. Y., Jamestown—City Bd. Pub. Utilities, T. V. McKee, secy., City Hall, preliminary [illegible] underway expan. electric light and power plant, incl. installing 2 new boilers, [illegible] equip., turbo-generator, Steele St. [illegible]. J. G. White Engrg. Corp., 80 [illegible] St., New York, consult. engr. C. O. [illegible], c/o owner, supt. CD 8/7—ENR [illegible].

N. Y., New York—President Manhattan [illegible], W. D. Binger, comr. Boro Wks., Municipal Bldg., Zone 7, addnl. mixer and dryer [illegible] at Municipal Asphalt Plant, 90 St. [illegible] East River Dr. (PM-85). $250,000. D. [illegible] Edwards, ch. engr. CD 1/31—ENR 2/10.

N. Y., New Rochelle—New Rochelle [illegible] Housing Auth., 271 North Ave., plans [illegible] underway by Mayer, Whittlesey & Lyon, [illegible] North Ave., Hugenot Gardens, NYS-7. [illegible],200.

N. Y., Port Chester—Port Chester Housing Auth., 110 Willett Ave., plans underway by Firm of Frederick G. Frost, 144 E. [illegible] St., New York, Zone 16, housing, NYS-16. [illegible],000. CD 6/10/43—ENR 6/17/43.

N. C., Chapel Hill—University of North [illegible]rolina, F. Graham, pres., Chapel Hill, [illegible] underway by W. Faulkner, 917 15 St. [illegible], Wash., D. C., theatre on site east of [illegible]rehead-Patterson Bell Tower. $350,000.

N. C., Pembroke—Pembroke State College, [illegible] R. D. Wellons, pres., Pembroke, plans by [illegible]smaker & Cooper, Box 5445, Raleigh, [illegible]inistration, science and music bldgs., [illegible]nitory, dining hall, central heating plant, [illegible] etc. To exceed $300,000.

O., Cleveland—City Transit Bd., A. C. Kennedy, purch. agt., 1404 E. 9 St., plans A. C. Wolf, Swetland Bldg., brick, steel, [illegible]crete motor coach station, at Superior [illegible] and Lakeview Rd., $387,000; brick, [illegible], concrete motor coach station, Pearl [illegible], $333,500. Financing not yet provided

O., Cleveland—Joint Veterans Comn. of Cuyahoga Co., J. H. Price, pres. and [illegible], Leader Bldg., $7,000,000 bond election [illegible]. 1, war memorial bldg. Garfield, Harris, [illegible]binson & Schafer, National City Bldg., [illegible]ts.

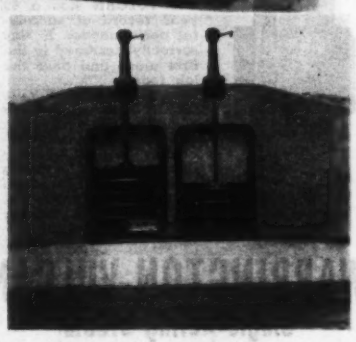
O., Perrysburg—Bd. Educ., G. Roose, [illegible], plans by Britsch & Munger, 1025 [illegible]holas Bldg., Toledo, 3 story, brick, steel, [illegible]crete high school addn. and elementary [illegible]ool. $387,000. Bond election Nov. 7 for [illegible]e.

Ore., Mount Pleasant (Mail Oregon City)—Clackamas Co., Oregon City, plans by [illegible]kes & Allyn, Hughes Bldg., Portland, concrete home, near here. $150,000. D. T. [illegible]trum, Oregon City, engr.

Pa., Allentown—Bd. Mgrs., Allentown [illegible] Hospital, tentative plans by Robt. Lange, [illegible]town, 6 story administration bldg. [illegible], addns. to other units, altering, imprv. [illegible]ing structures. Over $500,000.

R. I., Newport—City, c/o Chief Eldredge, [illegible] Dpt., plans by Noel & Miller, Newport, [illegible]ional garage housing and repairing fire, [illegible]e and Pub. Wks. Dpt. motor vehicles, [illegible] $150,000; 2 story, basmt., 30x60x100 ft., [illegible], steel fire station, over $150,000. Fi[illegible]ing not yet provided for.

HERE IS PROOF



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POSTWAR PROJECTS (Cont'd.)

Tex., Austin—State, c/o C. Stevenson, gov., Austin, state library and archives bldg. Over $150,000. B. E. Giesecke, 504 W. 32 St., consult. archt.

★**Tex., Dallas**—City, Dallas Co. and Southwestern Medical Foundation Center, 3301 Junius St., preliminary plans completed by Geo. L. Dahl, Southland Life Annex, hospital and medical college, facilities, $5,000,000. Bond election will be called to provide funds for County-City share. CD 8/25—ENR 9/7.

★**Tex., Kingsville**—Texas College of Arts and Industries, E. N. Jones, pres., Kingsville, plans by Phelps & DeWees & Simmons, 1515 Majestic Bldg., San Antonio and Eggers & Higgins, consult. archts., 542 5 Ave., New York, N. Y., home economics bldg., $175,000; agriculture bldg., $150,000; business administration bldg., $150,000; educational and teacher training bldg., $200,000; Administration-library bldg., $500,000; Fine Arts bldg., $250,000; Union bldg., $400,000; dormitories for women, $800,000; Engineering bldg., $350,000; gymnasium with inside track, courts, etc., $100,000; museum, $150,000; sanitary sewer facilities for college bldgs. and area, over $25,000; paved road and streets, concrete walks in college area, over $25,000; grading, drainage, and grounds development of college area, over $25,000; water facilities for college area, over $25,000.

Tex., San Antonio—San Antonio Bd. Educ., Lavaca and Matagorda Sts., plans 50% completed by Phelps & DeWees & Simmons, 1515 Majestic Bldg., Junior High School. $150,000. CD 9/23/43—ENR 9/30/43.

Va., Goochland—State, plans about 30% completed by Carneal, Johnston & Wright, Atlantic Life Bldg., Richmond, 8 bldgs. at State Industrial Farm for Women, incl. hospital, 3 dormitories, laundry, shop and assembly bldg., administrative and storage bldg., staff house, $395,000.

★**Que., Quebec City**—Province of Quebec, Quebec City, power generating stations providing electrification entire Gaspe Peninsula. $500,000. Quebec H-E Power Comn., Quebec City, engr.

READY FOR BIDS.

Minn., St. James—City, Laurette Grogan, clk., City Hall, plans completed by E. H. Schmidt & Co., 314 Coughlan Bldg., Mankato, 1 story, rein.-con., brick, memorial auditorium, $200,000.

★**N. Y., New Rochelle**—New Rochelle Housing Auth., 271 North Ave., plans completed by Mayer, Whittlesey & Lyon, 271 North Ave., Winyah Gardens, NYS-3, $853,820.

N. Y., New York—Bd. Educ., 49 Flatbush Ave. exten., Brooklyn, Zone 1, plans completed altering 4 story P.S. 12, at 3550 Frisby Ave. $429,000. E. Kebbon, c/o owner, engr. CD 1/13—ENR 1/27.

N. Y., New York—Bd. Educ., 49 Flatbush Ave. exten., Brooklyn, Zone 1, plans completed altering 4 story P.S. 102, at 1827 Archer St., $205,000. E. Kebbon, c/o owner, engr. CD 1/13—ENR 1/27.

N. Y., New York—Bd. Educ., 49 Flatbush Ave. exten., Brooklyn, Zone 1, plans completed altering 4 story P.S. 105, at 735 Brady Ave. $210,000. E. Kebbon, c/o owner, engr. CD 1/13—ENR 1/27.

N. Y., New York—President Manhattan Boro., W. D. Binger, comr. Boro Wks., Municipal bldg., plans completed dust elimination sys., Municipal Asphalt Plant, 90 St and East River Dr., (PM-84), $100,000. D. G. Edwards, ch. engr. CD 1/21—ENR 2/10.

★**N. Y., Yonkers**—Yonkers Municipal Housing Auth., 850 S. Bway., plans completed by Yonkers Associated Architects L. F. Thorn, F. A. Carr, E. Kaeyer, 25 S. Bway., Cottage place Gardens, NYS-6, $285,900. CD 2/4/43—ENR 2/11/43.

Tenn., Memphis—John Gaston Hospital, c/o Com. D. C. Miller, Court House, plans completed by Schulz & Norton, Shrine Bldg., constructing brick, rein.-con., steel hospital, and remodeling addns. to John Gaston Hospital. $375,000.

COMMERCIAL BUILDINGS

PROPOSED WORK

★**Conn., Danbury**—Reynold Brothers, Inc., 87 West St., housing development on 149 acre site, Candlewood Lake, Sunset Point, incl. artesian well water sys., macadam roads, water main, $1,000,000; 40 frame homes, Candlewood Section, $300,000.

Conn., Stamford—Home Builders Guild, J. B. Warner, Middlesex Rd., Darien, dwellings, residential development, Vine St. Sect. $150,000.

★**Kan., Wichita**—Wesley Hospital, 550 N. Hillside St., hospital addn., and remodeling present bldg. $500,000.

★**Mass., Pittsfield**—Hillcrest Surgical Hospital, 795 North St., brick, steel hospital, $500,000.

★**Mich., Detroit**—United Automobile Workers, C.I.O., 411 West Milwaukee Ave., 11 story, modern hospital. $1,500,000.

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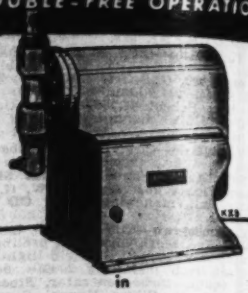

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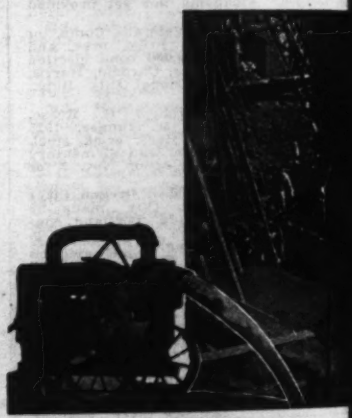

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Self-Priming Centrifugal Pumps

...TWAR PROJECTS (Cont'd.)

..., St. Paul — Minnesota American ... Foundation, American Legion ... Headquarters, Historical Bldg., St. ... J. C. Hormel, Austin, memorial ... Financing to be started

..., University City (br. St. Louis)—St. ... Archdiocese of the Catholic Church, Archbishop J. J. Glennon, 4901 Lindell ... St. Louis, Zone 5, rein.-con., brick, ... high school, on site east of Pennsyl- ... Ave. adjoining Haman Park, Over ..., with equip. Site purchased. CD ...-ENR 12/2.

..., Y., New York—Metropolitan Life In- ...rance Co., Madison Ave., Zone 10, house- ...on 12 acre site, bounded by 135 and 138 ...d Ave. and Harlem River. $5,000,000.

..., Cleveland—Cleveland Catholic Diocese, ...ngr. Balmat, N. B. C. Bldg., church and ...at ne Mayfield Rd., east of Brainard ...,000. Financing to be provided ...Site purchased.

..., Massillon—Corporation, c/o E. J. ..., Massillon, hotel, $500,000.

..., Bristol—Burnside Memorial Hospi- ...Bristol, brick hospital addn. $150,000.

..., Houston—Catholic Charities of the ... c/o N. Dietrich and J. Hamblen, ...Bldg., 3 story, masonry, steel type ...al, 1400 Blk. Lyons Ave. $150,000.

..., San Antonio—J. Ross Boles Co., ...122 E. Pecan St., commercial bldg., ...and apartments, etc. at 118 Convent ...,000. Site purchased.

..., San Antonio—St. Marks Episcopal ..., 115 E. Pecan St., new church unit, ...ft. tower, $150,000.

..., San Antonio—B. B. Smith, Alamo ...tional Bldg., 105 frame, stucco, brick ...ngs. $875,000. Site purchased.

..., Milwaukee—Boston Store, W. Wis- ...sin Ave. and N. 4 St., 8 story depart- ...ore addn. $2,000,000.

..., Watertown—Sgt. F. L. Pitterle Post ...erican Legion, Watertown, 2 story, ..., 100x200 ft. club house.

...N UNDERWAY

..., Flintridge—R. A. Holtzinger, La ..., preliminary plans underway by P. R. ..., 3767 Wilshire Blvd., Los Angeles, ...ing Flintridge club into hotel. $315,-

..., Atlanta—J. A. Jones Constr. Co., ...W. 4 St., Charlotte, N. C., sketches ...by Burge & Stevens, Palmer Bldg., ..., 100 x 200 ft. hotel. $2,500,000.

..., Decatur — Young Men's Christian ..., Prairie and Church Sts., plans ...mpleted by Harris & Spangler, assoc. ...Standard Office Bldg., and Aschauer ...ssoc., 113 N. Main St., 4 story, 123x ... in front, 131x168 ft. in rear, brick ...A. bldg., concrete fdn., Prairie St. ...,000. CD 11/12—ENR 12/2.

..., Portland—Westbrook Junior College, ...rook Ave., plans by F. J. Larson, ...archt., Hanover, N. H. dormitory, ...e Ave. Over $200,000. Financing not ...vided for.

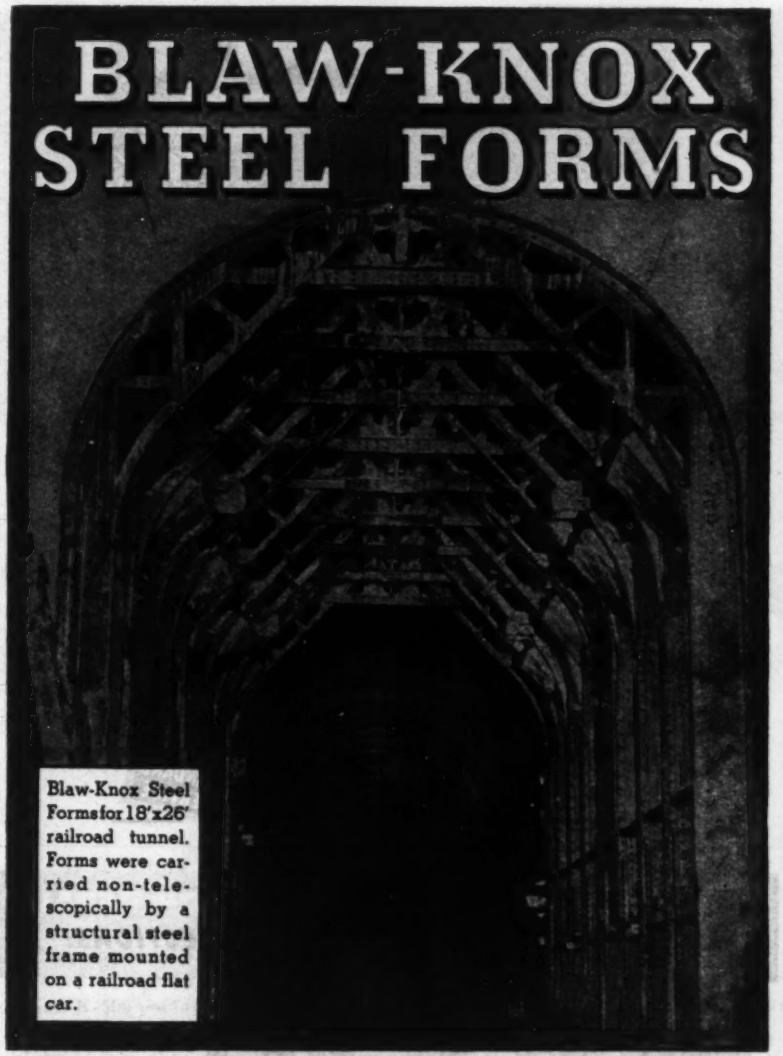
..., Towson—Goucher College, St. Paul ...25 Sts., plans underway by Moore ...ins, 11 E. 44 St., New York, N. Y., ...2 story stone bldgs. for classrooms, ...m halls, residences for faculty. ...ms.

..., Boston—Owner, c/o S. S. Eisenberg, ...69 Summer St., plans underway 60 ...family home units. $480,000.

..., Watertown—Owner, c/o E. B. Strat- ...ton, 62 Broad St., Boston, plans un- ...16 frame homes. $609,000.

..., Worcester—Greek Orthodox Church ...C. M. Meschop, 21 Morningside Rd., ...derway by Eugene Bros., 1320 W. ...Chicago, Ill., 2 story, bsmnt., brick, ...urch. Russell, Elm and Cedar Sts. ... Financing not yet provided for.

BLAW-KNOX STEEL FORMS



Blaw-Knox Steel Forms for 18'x26' railroad tunnel. Forms were carried non-telescopically by a structural steel frame mounted on a railroad flat car.

For a Better Job in Less Time

The design and fabrication of heavy forms is no "side line" at Blaw-Knox. An entirely separate department of Form Engineers has devoted years to this specialized business with many notable successes to prove their ability. From past experience they have learned how to plan a concrete construction job so that the work will proceed quickly, smoothly and at the lowest possible cost.

Current construction of a sufficiently urgent nature can now be served, and long range planning for future contracts can be aided by Blaw-Knox engineers.

BLAW-KNOX STEEL FORMS are used for the construction of TUNNELS · WALLS · SEWERS · DAMS · BRIDGES · PIERS · CONDUITS · ROADS · SEWAGE DISPOSAL PLANTS and other varieties of concrete construction

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MANY highway departments have found the answer to today's problem of keeping highway systems up to wartime efficiency, and preserving them for peacetime needs, by the method of asphalt-resurfacing described here and pictured in the cross-section above.

A. **Spot Patching.** Where the old highway surface is badly broken, holes are patched by filling with the same mix as used in the binder course.

B. **Prime Coat.** A thin coat of cut-back asphalt, spread over the old road surface. When used, it helps to bind the asphalt to the old surface.

C. **Binder Course.** An asphalt-aggregate mix. It is delivered hot from the central mixing plant to an asphalt finishing machine.

D. **Wearing Course.** This is the top course, composed of asphaltic concrete with a fine aggregate. It is hot mixed, and laid by machine. It presents a smooth, water-proof, long-wearing surface which requires no seal coat or stone application.

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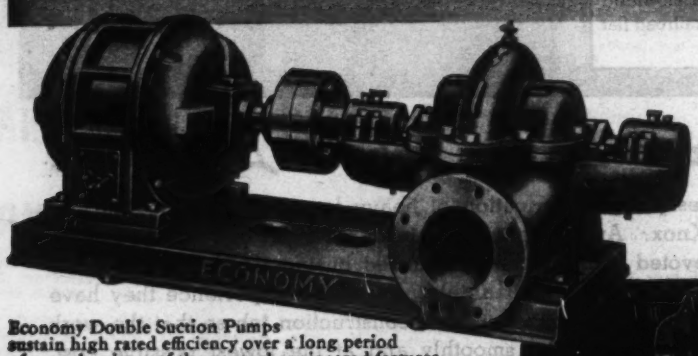

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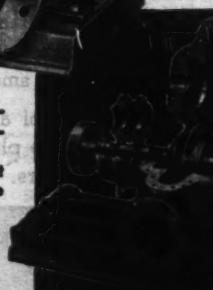

ECONOMY PUMPS, INC.
HAMILTON, OHIO, U. S. A.

POSTWAR PROJECTS (Cont'd.)

★**Mich., Hamtramck**—Sisters of St. Fra... cis, Sylvania, O., plans underway ... Jos. C. Goddeyne, 418 Bay City Bank Bld... Bay City, hospital, Outer Dr. $625,000.

Mich., Howell—Howell Sanitarium, How... preliminary plans underway by C. R. A... ley, Lansing, employees dormitories a... maintenance shops. Approx. $200,000.

★**Minn., Northfield**—St. Olaf College, C... Granskou, pres., Northfield, plans ... completed by Lang & Raugland, 502 We... Temple Bldg., Minneapolis, girls' dormito... $350,000; chapel, $300,000. CD 10/6/43—E... 10/21/43.

Mo., St. Louis—St. Louis Archdiocesa... the Catholic Church, c/o Archbishop J... Glennon, 4901 Lindell Blvd., Zone 4, p... liminary sketches by H. B. Hess, Ambas... dor Bldg., 7 and Locust sts., Zone 1; 2... 4 story, rein.-con., brick, stone high sch... on tract bounded by Bessie and Ander... Aves., on Newstead Ave. Over $300,... with equip. CD 8/7—ENR 8/24.

N. H., Northfield (mail Tilton)—Gol... Rule Assn., Northfield, plans by E. F. Ma... nau, Center St., Concord, brick administrat... and dormitory bldg., Golden Rule Far... $150,000.

★**N. Y., Forest Hills**—Syndicate, c/o Sh... pan & Shampan, archts., 26 Court ... Brooklyn, Zone 2, plans underway 4 st... apartment, 66 Ave. and Wetherale ... $550,000.

Ore., Salem—Young Men's Christian As... Salem, plans completed by R. L. Rayb... 420 Lexington Ave., New York, N. ... Y.M.C.A. addn. $300,000. Financing not ... provided for.

Tex., Cuero—J. T. Newman, Cuero, p... 15% completed by W. B. Morgan, ... Audubon St., Houston, 6 story, rein.-... brick hotel and stores bldg. $250,000. G... rett Engineering Co., 1806 Milam St., Ho... ton, consult. engr.

Tex., Houston—Central Methodist Chu... 6309 Harrisburg Rd., plans 25% compl... church, 1000 Blk. Wayside Dr. $125,... $150,000. Site purchased.

Tex., McAllen—Church of the Sacred H... Congregation, S. 15 St. and Chicago ... plans 25% completed by Julian & Wi... 609 Kampman Blvd., San Antonio, 2 st... brick, rein.-con. convent. $150,000.

Tex., San Antonio—M. J. Chagnard, ... Roosevelt Ave., plans 10% compl... thirty-five 1 and 2 story dwellings. Blk... Woodlawn Hills. $250,000. Site purchased.

READY FOR BIDS.

★**N. Y., New York**—Joseph P. Day, ... 405 Lexington Ave., Zone 17, plans ... pleted by G. W. Iser, 109 E. 29 St., Zone ... 6 story, 56x107 ft. apartment, 163 St. ... Southern Blvd., $430,000; 6 story, 125x8... apartment, Southern Blvd. 178 ft. nort... 163 St., $438,500; 6 story, 100x118 ft. a... ment, 163 St. and Hoe Ave., $238,000.

★**N. Y., New York**—Eastmanton C... 55 Fifth Ave., Zone 3, plans comp... by R. B. Smith, 52 Vanderbilt Ave. ... 17, 16 story, 80x100 ft. office and store b... 30 W. 52 St. $740,000.

★**N. Y., New York**—88 Corp., c/o H. ... bern, archt., 205 E. 42 St., Zone 17, ... completed, 10 story, penthouse apart... 198 W. 89 St., $500,000; 10 story, penth... apartment, 179 W. 88th St. $625,000.

N. Y., New York—Emigrant Industrial ... ings Bank, 51 Chambers St., Zone 7, ... completed by H. I. Feldman, 415 Lexi... Ave., Zone 17, 6 story, 84x107 ft. apart... on 140 St. near 3 Ave. $150,000.

N. Y., New York—Equitable Life Assu... Society, 393 Seventh Ave., Zone 1, ... completed remodeling 5 and 7 Park Ave... razing No. 5 and building 15 story addi... No. 7. $275,000. L. M. Salisbury, c/o ... engr.

N. Y., New York—4959 Broadway, ... 570 5 Ave., Zone 19, plans completed ... Ginsbern, 205 E. 42 St., Zone 17, 10 ... pent house, 100x125 ft. apartment, 65-... 88 St. $300,000.

★**N. Y., New York**—Grenlo Realty ... 2325 Ryer Ave., Zone 17, plans com... by H. I. Feldman, 415 Lexington Ave., ... 17, 6 story, apartment, East Tremont ... southwest corner Crotona Ave. $2... 6 story apartment, East Tremont Ave., ... east corner Belmont Ave., $250,000.

N. Y., New York—M. Halpern, 124 ... St., Zone 28, plans completed by L. S... 705 Gerard Ave., Zone 51, 6 story, 66... apartment, 1380-1386 Riverside Dr. $...

★**N. Y., New York**—Harris Ratner, ... 30 Ellwood St., Zone 34, plans com... by L. Stillman, 705 Gerard Ave., Zone ... story, 85x100 ft. apartment, 16 Bro... Pl., $170,000; 6 story, 75x85 ft. apar... 27-31 N. Nagle Ave., $125,000; 6 story, ... 125 ft. apartment, 32-41 Nagle Ave., $...

★**N. Y., New York**—Hoguet Real ... Corp., 415 Lexington Ave., Zone 17, ... completed by H. I. Feldman, 415 Lexi... Ave., Zone 17, 20 story, 85x164 ft. apar... 201-205 E. 79 St. $800,000.

N. Y., New York—Matmar Realty ... 521 5th Ave., plans completed by H. ... bern, 205 E. 42 St., Zone 17, 11 story, ... house apartment, 15 W. 84 St. $...

TWAB PROJECTS (Cont'd.)

K. Y., New York—Seaman's Bank for ...ings, 74 Wall St., Zone 5, plans com... by E. J. Hurley, 535 5 Ave., Zone 17, ...story, penthouse, 100x156 ft. apartment, ... Park Ave. $975,000.

N. Y., New York—Shachnow & Brown, ...37 Fifth Ave., Zone 17, plans completed ...R. Ginsberg, 205 E. 42 St., Zone 17, two ...ory, 100x150 ft. apartments at 408-430 ...98 St., $450,000; 6 story, 100x100 ft. ...tment at 417-423 W. 205 St., $150,000; 6 ...y, 194x100 ft. apartment 425-431 W. 205 ...$150,000; 6 story, 100x100 apartment at ...424 W. 206 St., $150,000.

N. Y., New York—Society of New York ...pital, 535 E. 68 St., Zone 21, plans com... by Coolidge, Shepley, Bulfinch & Ab... 1 Court St., Boston, Mass., altering New ...k Hospital incl. rearrangement of wards, ...ic rooms, laboratories and offices. ...,000.

N. Y., New York—Stanley Properties, Inc., ...Fifth Ave., Zone 3, plans completed by ...I. Feldman, 415 Lexington Ave., Zone 17, ...story, penthouse, 80x100 ft., apartment, at ...1 W. 96 St. $375,000.

N. Y., New York—Vinmont Land Corp., E. ...Boyd, vice pres., 400 Madison Ave., Zone ...plans completed by R. C. Weinberg, 400 ...ison Ave., Zone 17, thirty 2 story bldgs., ...holu Ave., 255 and 254 Sts. $270,000.

N. Y., New York—Maude A. K. & Edith ...M. K. Wetmore, c/o J. Lau, archt., 5 ...man St., Zone 7, plans completed 15 ...y office bldg., 314 West 42 St. $750,000.

Ore., Portland—A. C. Millers, 811 N. E. ...Brazee, Portland, plans completed by ...E. Panhorst, 2023 N. Flint St., 75 wood ...s, brick homes on 340 acres north of ... Skyline Heights. $1,000,000.

TRACTS AWARDED

...ulf., Los Angeles—Motion Picture Re...ief Fund, 23350 Mulholland Dr., group ...con. and reinforced brick hospital ..., to Joshua A. Marks Co., 816 W. 5 ...pprox. $650,000. W. L. Pereira, archt., ...E. C. Hillman Jr., structural engr., both ...Architect Bldg. Holmes & Narver, 639 S. ...g St., mech. engr.

INDUSTRIAL BUILDINGS

POSED WORK

...lf., Oakland — PLANT — Jones-Dabney ...Devoe & Reynolds Co., 1481 S. 11 St., ...sville, Ky., resin mfg. plant, on 5 acre ...n East Oakland.

...n., Stamford — GARAGE, etc. — Ford ... & Services, 4 Pleasant St., garage, ...obile show room and service bldg. $40,000.

..., Jeannette—FACTORY—Model Laundry ...ry Cleaning Co., Jeannette, factory. $50,000.

..., Providence—PLANT—Swiss Clean... Co., 676 Elmwood Ave., sketches brick, ...cleaning plant addn., Elmwood Ave., ...0.

..., Houston—WAREHOUSE—Jax Brew... Co., 2500 Commerce St., warehouse, ...r and Live Oak Sts. Over $40,000. ...purchased.

..., Houston—PLANT—Regan Force & ...neering Co., 6220 Navigation Blvd., ... and shop, Lockwood Dr. and Sonora ...000,000. Site purchased.

..., Houston — STORAGE and WARE...SE—Warren Co., 614 Walker Ave., stor...nd warehouse, Velasco and Palmer Sts. $40,000. Site purchased.

..., San Antonio—WAREHOUSES, etc.— ...uml & M. J. Chagnard, 923 Roosevelt ... industrial center, incl. warehouses, ...bldg., railway tracks, utilities-under... on 238x800 ft. site, 900 Blk., Roose...ve. Over $150,000. Site purchased.

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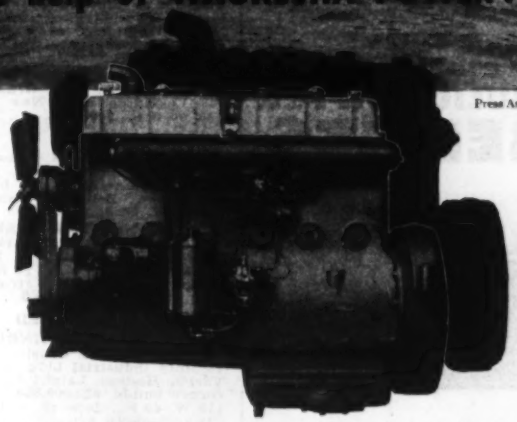

● Powered by Waukesha Engines, two of a battery of big Ingersoll-Rand K-500 portable air compressors . . . mounted on the barge at the right . . . are shown helping to raise the *U.S.S. Oklahoma* after the Japanese raid on Pearl Harbor.

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POSTWAR PROJECTS (Cont'd.)

Ont., Toronto—PLANT—Acadian Venetian Blinds, Ltd., 2174 W. Dundas St., plant addn. $40,000.

Que., Port Alfred—PLANT—Consolidated Paper Corp., Port Alfred, modernization plant, equip. $300,000.

PLANS UNDERWAY

Calif., Laguna Beach — LABORATORY — Townsend-Brown Foundation, c/o Kenneth S. Wing, archt., 501 Termino Ave., Long Beach, preliminary plans underway laboratory used for research into field radiation. $240,000, incl. equip.

Idaho, Boise — WAREHOUSE — Salt Lake Hardware Co., 105 N. 3 W., Salt Lake City, Utah, plans by Wayland & Fennell, 216 N. 8 St., 150x360 ft., steel, concrete warehouse. Eighth and Battery Sts. $200,000.

Md., Baltimore — PUBLISHING — Afro American Pub. Co., 628 N. Eutaw St., plans underway by A. I. Cassell, 1903 14 St. N.W., Wash., D. C., 2 story, bsmnt. newspaper publishing bldg. $250,000.

Mass., Fall River — PLANT — Coca Cola Bottling Co., 95 Pleasant Valley Parkway, Providence, R. I., plans by J. M. Sheldon, Bona Allen Bldg., Atlanta, Ga., brick plant, distribution facilities. $45,000.

★**O., Cleveland**—FACTORY—S. K. Wellman Co., (Powder Metalbury), S. K. Wellman, pres., 1274 E. 51 St., plans by S. K. Rowley & Assoc., Keith Bldg., 2 story, bsmnt., brick, steel, concrete factory addn. $500,000.

Tex., Houston — WAREHOUSE — Wald Transfer & Storage Co., 312 Live Oak St., plans 75% completed by Jos. Finger, Inc., National Standard Bldg., brick, hollow tile, concrete warehouse. Over $150,000. CD 1/19—ENR 1/27 under Industrial Bldgs.

Ont., Niagara Falls—STATION—New York Central System, S. E. Armstrong, chf. engr., 466 Lexington Ave., New York, 17, N. Y., new station. $100,000.

READY FOR BIDS

★**N. Y., New York** — LAUNDRY, etc. — Gotham Leases, Inc., 547 W. 23 St., Zone 11, plans completed by I. M. Fenechel, 524 5 Ave., Zone 18, laundry and garage, 527-41 W. 23 St. $560,000.

★**N. Y., New York**—WAREHOUSE, etc.—Seamen's Bank for Savings, 74 Wall St., Zone 5, plans completed by E. J. Hurley, 535 5th Ave., Zone 17, 11 story, 75 x 100 ft. brick warehouse and trucking depot, 10 Ave. and 53 St. $600,000.

CONTRACTS AWARDED

★**N. Y., New York** — INDUSTRIAL — Tishman Realty & Constr. Co., 136 E. 57 St., 13 story industrial bldg. on site bounded by Varick, Hudson, Laight Sts., and Ericssen Pl. Owner builds. $10,000,000. V. Mayper, engr., 110 W. 40 St., Zone 18, will design structure. CD 5/12—ENR 6/1.

UNCLASSIFIED

PROPOSED WORK

Conn., Westport—PARK—State Park & Forest Comn., G. C. Waldo, chrn., State Capitol, Hartford, land construction, beautification for park, Sherwood Isle, New Road with Clover Leaf Intersection at Post Rd. $150,000.

★**Kansas**—GAS PIPELINE—Kansas Consolidated Gas Corp., c/o C. D. Reasor, 411 Beacon Bldg., Wichita, approx. 245 mi. 16 in. pipeline from Hugoton to Wichita. $2,500,000.

Ky., Crescent Spring—BROADCASTING STATION—L. B. Wilson, Inc., WCKY, 5 and Walnut Sts., Cincinnati, O., FM radio broadcasting station, near here, over $25,000.

Mich., Battle Creek—RADIO STATION—Federated Pubs., Inc., WELL, 1 W. Michigan Ave., FM radio station. $25,000.

Mich., Eloise—CEMETERY IMPROVEMENTS—Wayne Co. Infirmary, Eloise, landscaping cemetery, institution grounds, filling land along creek and grading for proposed new bldgs. $100,000.

Mich., Jackson — RADIO STATION — WIBM, Inc., Jackson, FM radio station. Over $25,000.

Mich., Lansing — RADIO STATION — WJIM, Inc., 126 W. Allegan St., FM radio station. $25,000.

Mich., Port Huron—RADIO STATION—Times Herald Co., 802 Military St., Port Huron, FM radio station. Over $25,000.

Minn., Granite Falls—AIRPORT—City, E. H. Winter, mayor, municipal airport. $25,000.

Minn., Hector — AIRPORT — Village, O. Melberg, clk., imprv. municipal airport, incl. grading, erecting hangars and administration bldg. Over $25,000.

Minn., Jackson—AIRPORT—City, S. M. Iverson, mayor, airport. $25,000.

Minn., Slayton—AIRPORT—City, G. K. Lowe, mayor, City Hall, reconditioning, imprv. emergency landing field. $25,000.

Minn., Sleepy Eye—AIRPORT—City, C. C. Hanson, mayor, City Hall, imprv. airport. $25,000.

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with up to 5 times faster priming, with hi-head, hi-capacity performance, with thousands of extra hours of trouble-free service.

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TWAR PROJECTS (Cont'd.)

Tyler—AIRPORT—Village, F. N. mayor, municipal airport. $25,000.

Wisdom—AIRPORT—City, C. Hofmayor, municipal airport. $25,000.

H. Manchester—RADIO STATION—Voice of N. H., Inc., WMUR, 1319 Elm Manchester, FM radio station. Over

York—FISH HATCHERY—Dpt. P. State Office Bldg., Albany, Zone 1, Belmont Rearing Station at Chautauqua for Div. Fish & Game Dpt. Conserva-

C., Raleigh — BROADCASTING STA-WPTF Radio Co., Insurance Bldg., broadcasting station, Hy. 1. Over $25,000.

C., Winston-Salem—BROADCASTING TION—Piedmont Pub. Co., WSJS, 416-N. Marshall St., FM broadcasting sta-Alder and Liberia Sts. $25,000.

Akron—BROADCASTING STATION—Radio Corp., WAKR, 1st Central 106 S. Main St., FM broadcasting sta-1st Central Tower. Over $125,000.

Akron—TROLLEY LINE, etc.—Akron portation Co., Wm. H. Muldoon, vice and genl. mgr., 47 N. Main St., 3 bus lines extens., greater Akron dist., installing double overhead trolley lines Barberton-Kenmore dist., Cuyahoga and Arlington St.-Airport area. $250,-

Ashland—BROADCASTING STATION Herr & Koehl, Ashland, FM radio broadcasting station, Route 42. $25,000.

Ashtabula — BROADCASTING STA-WICA, Inc., Jefferson Rd., FM Broadcasting station, east side Jefferson Rd. Over

Canton—BROADCASTING STATION—Broadcasting Co., WHBC, 550 Market S. FM broadcasting station, Lakeside $25,000.

Cincinnati — BROADCASTING STA-The Crosley Corp. WLW, Crosley Sq., and Elm Sts., FM broadcasting station,

Cleveland — BROADCASTING STA-National Broadcasting Co., Inc., AM, 815 Superior Ave., FM broadcasting tion, Snowville Rd. $25,000.

Cleveland — BROADCASTING STA-United Broadcasting Co., WHK, 1311 minal Tower, FM broadcasting station.

ansylvania — POWER AND LIGHT DS—Warren Rural Electric Co-Opera-Inc., Pittsfield, rural electric power light lines from present terminus 5 St. into northern Glade Twp., Scandia area, ren Co. $40,000.

Bethlehem—BROADCASTING STA-Associated Broadcasters, Inc., Beth-FM broadcasting station, near here.

Harrisburg—BROADCASTING STA-Keystone Broadcasting Co., WKBO, 3 St., Harrisburg, FM Broadcasting $25,000.

Lancaster—BROADCASTING STA-WGAL, Inc., 4-10 W. King St., FM casting station. $25,000.

Phila.—BROADCASTING STATION alter Service Co., 12 S. 12 St., FM casting station, 12 S. 12 St. $25,000.

Phila.—BROADCASTING STATION DAS Broadcasting Sta., Inc., 1211 Chest-St., FM broadcasting station. $25,000.

Pittsburgh—BROADCASTING STA-Pittsburgh Radio Supply House, 1406 Chamber of Commerce Bldg., broadcasting station, 1459 Crane Rd.

Pittsburgh—BROADCASTING STA-WCAE, Inc., Wm. Penn Hotel, FM casting station, Agnew Rd., Baldwin $25,000.

Sharon—BROADCASTING STATION ron Herald Broadcasting Co., WPIC, 2, Dutch Lane, FM broadcasting sta-R.D. 2, Dutch Lane. $25,000.

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POSTWAR PROJECTS (Cont'd.)

Pa., Wilkes-Barre—BROADCASTING STATION—L. G. Baltimore, WBRE, 62 Franklin St., FM broadcasting station, Lozerne Co. **$25,000.**

Pa., York—BROADCASTING STATION—York Broadcasting Co., WORK, 13 S. Beaver St., FM broadcasting station. **$25,000.**

Tex., Denison—AIRPORT—City, R. Asburn, mayor, Class 1 or 2 airport, Randa Lake reservation. **$275,000.**

Tex., Houston—BROADCASTING STATION—Houston & Printing Corp., KPRC Lamar Hotel, FM broadcasting station Esperson Bldg. **$25,000.**

Alta., Coleman—AIRPORT—Municipality airport. **$150,000.**

★**Alta., Edmonton**—TELEPHONE SYSTEM EXTENSION—Municipality, extend telephone sys. **$527,000.**

PLANS UNDERWAY

Conn., Norwalk—PLANT—The Hill Co Connecticut Ave., plans 25% completed by D. Mansell, 24 Park Row, Stamford, 1 story 65x124 ft., brick plant, Post Rd. **$40,000.**

Ga., Rome — SWIMMING POOL — City plans 75% completed swimming pool. **$30,000.** Roberts & Co., Bona Allen Bldg., Atlanta, consult. engrs.

Ind., Indianapolis — AIRPORT — Roscoe Turner Aeronautical Corp., Col. R. Turner pres., Municipal Airport, preliminary plans completed 1 story, 150x150 ft., stone, brick structural steel, rein.-con. airport hangar addn. **$150,000.**

★**Mich., Belleville** — PARK DEVELOPMENT — Huron Clinton Metropolitan Auth., 2456 Penobscot Bldg., Detroit, preliminary plans underway park development along artificial lake to be enlarged by constructing proposed dam. **$1,000,000.** G. W. McCordic, 2456 Penobscot Bldg., Detroit, engr.

Mich., Hamtramck—City, 8540 Jos. Campau Ave., plans underway concrete outdoor swimming pool, **$41,500.** I. M. Kopkowski, 8540 Jos. Campau Ave., city engr.

Mich., River Rouge—UNDERGROUND CONDUIT—City, plans underway underground conduit for fire sys. connections **$60,000.** Mason L. Brown & Son, 120 Madison Ave., Detroit, consult. engr. acting as city engr.

Minn., Glencoe—SWIMMING POOL—Chas. J. Holmes, member Postwar Com., swimming pool. **$25,000.** C. H. Buetow, 157 Edmund St., St. Paul, archt.

★**N. Y., Buffalo**—PARK IMPROVEMENTS—City, N. L. Nussbaumer, comr. P. Wks., City Hall, various park imprvs., $995,34 J. Ulinski, City Hall, comr. Parks.

★**N. Y., Olean**—AIRPORT—City Council, City Hall, plans underway municipal airport. **$900,000.** J. P. Donaly, c/o Boole Bldg. Co., 206 Sheridan Ave., Buffalo, consult. engr.

N. Y., St. George—GUARD RAIL FENCE—President Richmond Boro, C. A. Hag comr. Boro Wks., Boro Hall, plans underway 6 mi. guard rail fences, island wid (PRS-209), **$45,000.** State Aid Planning Funds allotted.

★**O., Cleveland**—RAPID TRANSIT SYSTEM, etc.—Cleveland Transit Comm W. J. McCarter, genl. mgr., 1404 E. 9 St rapid transit sys. from Cleveland suburbs downtown loop and construct subway downtown area. **$35,000,000.** Land right not cleared, and financing not yet provided for. M. M. Rex, c/o owner, engr.

★**O., Elyria** — AIRPORT — Comrs. Lora Co., E. R. Commings, clk., Court House election Nov. 7, to vote bonds, airport, bldgs runways. **$600,000.** Land rights not clear and financing not yet provided for. D. Patterson, Court House, co. engr. CD 8/24 ENR 8/24.

Okla., McAlester—GAS AND COMPRESSOR SYSTEMS—Public Service Co., 600 Main St., Tulsa, plans 40% complete natural gas and compressor sys. addns exten. **$250,000.**

B. C., Nelson—GAS MAINS, etc.—Municipality, extens. gas mains, Fairview, etc **$25,000.** S. H. Dawson, City Hall, engr.

Ont., Fort William—SKATING RINK, etc —Municipality, combined skating and curling rink, auditorium and swimming pool **$250,000.** H. M. Woodhouse, City Hall, engr.

Que., Quebec City — DAMS — Provincial Govt., Quebec City, necessary dams enabling electrification of Gaspe Peninsula. **$30** Quebec Hydro Power Comn., Quebec City engr.

★**Que., Quebec City**—PARK—Province of Quebec, Quebec City, constructing National Park in Mont Trembiant region, north of Montreal; completion of Mount Orford and Gaspesian National Parks. **$500,** Dpt. Lands & Forests, Quebec City, engr.

READY FOR BIDS.

B. C., Kelowna—SKATING and CURLING RINKS—Municipality, plans completed skating and curling rinks at civic center **$75,000.** H. A. Blakesborough, P. O. Box engr.

PROJECTS CANCELLED.

Minn., Fergus Falls—AIRPORT—City M. Lein, clk., City Hall, project cancelled Airport now going ahead. CD 8/24—EN 9/7.

CONSTRUCTION REPORTS

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

ELSIE EAVES, Manager *SCOTT McLEOD, Statistics* *J. A. MAHONEY, Reports*

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WATER SUPPLY

POSED WORK

Ky., Beechel—Bd. Comrs. Buechel Water approx. 41,450 ft. 6 to 12 in. water- distr. sys. with fittings, valves, ns, appurtenances, Ky. 15-188-N. 673. FWA.

Ark., Crawford—City, replacing 12 in. supply line and constructing addnl. ng basin, new roof on reservoir, etc., 25-157-N. $128,000. FWA. R. Fulton, S. 19 St., Lincoln, engr. CD 6/21—6/29.

N. C., Charlotte—City authorized issuance , modernizing, exten. WW sys. $155,000.

Ky., McKeesport—City, C. T. Bechtol, supt. r Works, bids soon WW imprvs. 00.

Tenn., Clinton—Town, water and sewer- extens., approx. 3,500 ft. 2 and 6 in. fire hydrants and meters, approx. 8,200 and 8 in. pipe, manholes and appur- nces, Tenn. 40-273-N. $35,500. FWA.

Tenn., LaFollette—City, water and sewer ities extens., approx. 4,250 ft. 6 in. and extending sewer collecting sys. incl. ox. 10,200 ft. 2 and 8 in. sewer mains, rtenances, Tenn. 40-275-N. $34,800.

Tex., Bay City—E. C. Doughtie, mayor, r and sewer extens. $305,000. Applied WA. S. A. Russell, Bay City, engr.

Tex., Colorado City—J. A. Sadlee, mayor, minary plans 1 m.g. concrete reservoir. 00. Freese & Nichols, Capps Bldg., Worth, engrs.

Tex., Temple—U. S. Eng., Fort Sam ston, addnl. water supply facilities, Mc- ey General Hospital, 400,000 gal. con- ground storage reservoir with wooden g tower and induced draft, 100,000 cap. elevated steel tank, Booster Sta- and equip., and necessary collection discharge piping.

Tex., Fort Worth—City, S. H. Bothwell, City Hall, completion water distr. imprvs., Tex. 41-641. $46,000. **FWA.** s & Nichols, 407 Capps Bldg., engrs. 9/15—ENR 9/21.

Wash., Seattle—City, Bd. P. Wks., County- Bldg., Zone 4, installing chlorinators reservoir outlets, increasing number fall measurements, etc. $107,000. C. artelle, County-City Bldg., Zone 4, city

Wis., Eau Claire—City, completing plans, soon 1 story, bsmnt., 66x100 ft. pump. n, 1 story, 24x100 ft. garage and storage 13,225 ft. 30 in. Class 150 pipe. A. R. ock, city engr. Greeley & Hansen, 6 ichigan Ave., Chicago, Ill., consult engrs.

Va., Portsmouth—City, approx. 12,000 ft. pipe raw water supply line from Lake on to filter plant at Lake Kilby, incl. rtenant work, etc., Va. 44-396-N. 00. FWA.

Ont., Paisley—Municipality, c/o E. D. , clk., P. O. Box 236, Paisley, surveys, sys. $°0,000.

Ont., Athabasca—Municipality, J. P. , secy., relaying watermains, etc. 00.

Ont., B., Bath—Bath Village Water & Fire c/o A. J. Drost, secy., surveys water mprvs. incl. purchase pumps. $25,000.

Ont., S., New Glasgow—Municipality, 5 mi. watermains. $200,000. W. S. Lea, University St., Montreal, Que., engr. /21—ENR 6/29.

Ont., Kenora—Municipality, exten. water- 1¼ mi. serving outlying district and ing duplicate mains imprv. general distr. sys. $50,0°0. J. A. McCoombs, Hall, supt. and engr.

Ont., Paisley—City Council, survey to be immediately and report prepared WW and fire protection, $25,000-$30,000. G. G. Town Hall, engr.

Ont., Port Stanley—Municipality, M. L. o, secy., new pump, unit, watermains. . T. F. Guttridge, H. E. and Water- Sys, Port Stanley, supt. and engr.

Ont., East Angus—Municipality, A. Tour- clk., water sys. $20,000. Dpt. P. Health, H spital, 1000 La Canardiere, Quebec engr.

Ont., Lebelle—Municipality, P. E. Forget, W sys. imprvs. $15,000.

Ont., Nandville — Municipality, H. che, clk., P. O. Box 120, Riverbend, sys. $25,000. Lavole & Delisle, timi, engr.

Symbols and Abbreviations Include:

* Federal Government
★ Project of $500,000 or over
ENR Engineering News-Record
CD Engineering News-Record Construction Daily

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger; water supply, earthwork, waterworks, $15,000; other public works, $25,000; industrial buildings, $40,000; other buildings, $150,000.

Classes of Construction

(Named in order of Listing)

Water Supply
Sewers, Waste Disposal
Bridges
Stree's & Roads
Earthwork, Waterways
Latin America
Public Buildings
Commercial Buildings
Industrial Buildings
Unclassified

Stages Reported

PROPOSED: (except Streets & Roads): B'DS ASKED (new announcements only. For full calendar, see also preceding issues of ENR);

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Que., Notre Dame des Laurentides (Postal Dist. Quebec City)—Municipality, water intake in Vallet Creek, near Lake St. Charles and other water sys. imprvs. $20,000.

Que., Rouyn—G. Beauchenim, town secy., bids soon WW sys., in Rouyn South. $50,000. R. Gagne, mayor. CD 1/18—ENR 1/20.

Que., St. Clement — Municipality, C. E. Delziel, mayor, WW sys. exten. $15,000.

BIDS ASKED

Bids Asked October 15

Mass., Norwood—Town, F. W. Smith, gen. mgr., Municipal Bldg., deep well turbine pump, unit. Fay, Spofford & Thorndike, 11 Beacon St., Boston, engrs. CD 8/28—ENR 8/31.

Bids Asked About November 1

Tex., Winters—City, WW imprvs., incl. dam, pipeline and treatment plant. $200,000. French Engineering Co., Abilene, engr.

Bids Asked Early In December

★**Tex., Houston**—Harris Co. and city of Houston, Houston, 1st sect. San Jacinto River Water Supply project, incl. pump. station at Huffman, approx. 25 mi. canal construction. Bids later about 40 mi. canal and enlarging 16 mi. canal, constructing dam across San Jacinto River. Total est. approx. $12,000,000 Haile, McClendon, Freese & Nichols, 2807 San Jacinto St., engrs. CD 7/24—ENR 7/27.

LOW BIDDERS

Tenn., Lewisburg—T. L. Cathey, mayor, Sept. 19, water facilities, bldgs., from Sullivan, Long & Hagerty, 2021 2 Ave. N., Bessemer, Ala., **$180,000,** water lines, from W. L. Hailey & Co., Cotton States Bldg., Nashville, **$195,000.** CD 8/22—ENR 8/24.

†**Tex., Nederland**—City, H. C. Farris, mayor, City Hall, Sept. 21, water distr. sys. addns., Tex. 41-593, from Beaumont Const. Co., Beaumont, **$25,735. FWA.** CD 9/11—ENR 9/14.

†**Tex., Spofford**—Town, J. York, mayor, City Hall, Sept. 26, water treatment plant, Tex. 41-653-N, from D. F. Pealer, Parklane Apartments, 5701 Jackson St., Houston, approx. **$19,600.** CD 9/12—ENR 9/14.

CONTRACTS AWARDED

Colo., Oak Creek—City, exten. pre-treatment works, deepening, raising earth-fill reservoir, force account. **$25,000.** B. Lowther, 710 Colorado Bldg., Denver, engr. CD 7/25—ENR 7/27.

†**Mich., Muskegon**—City, construct watermains, Mich. 20 357-F, to N. Santucci Constr. Co., Skokie, Ill., **$153,622.** FWA. CD 7/18—ENR 7/20.

†**O., Cleveland**—U. S. Eng., 925 New Federal Bldg., Pittsburgh, Pa., 500 000 gal. elevated steel water storage tank at Crile Hospital, to Pittsburgh-Des Moines Steel Co., Neville Island, Pittsburgh, Pa. Wilbur Watson & Associates, 4614 Prospect Ave., engrs. CD 6/27—ENR 6/29.

Tex., Cementville (P. O. San Antonio)—W. E. Simpson Co., engr., 1336 Milam Bldg., San Antonio, providing water basin for cooling tower, cold water well and clear well, for San Antonio Portland Cement Co., 1301 W. Martin St., San Antonio, to H. Page, Georgetown Rd., Austin, **$15,000.** Est. over $25,000. Bids 9/21. CD 9/13.

†**Tex., Corpus Christi**—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N W., Wash., 25, D C. water treatment facilities, Auxiliary Air Stations, Kingsville, Chase and Beeville Fields. NOY 10282, to M. F. Fischer & Son, 1412 Milam Bldg., San Antonio, Zone 5, **$83,000.**

Tex., Houston—City, M. H. Westerman, secy., two 5 m.g. steel reservoirs at S W. pumping plant, to Chicago Bridge & Iron Co., 5625 Clinton Dr., **$122,576.** CD 9/26—ENR 9/28, under LB.

†**Va., Portsmouth**—Bd. Supervs. Norfolk Co. at office County Purchasing Agent, installing 34,200 ft. 2- to 10-in. c.i. mains, Tanner's Creek Sect., Va. 44-406, to A. G. Pinkston & Co., Old Kirn Bldg., **$69,329.** Est. $72,900. **FWA.** Bids 9/22. CD 9/15—ENR 8/24.

Ont., Hurdman's Bridge (Postal Dist. Ottawa)—Dominion Govt., Ottawa, installing 10 in. watermain, to McLaughlin Bros., Scott St., Ottawa, **$35,000.** Bids 9/22.

SEWERS, WASTE DISPOSAL

PROPOSED WORK

Calif., Los Angeles—City, Bd. P. Wks., City Hall rejected bids Sept. 6, sanitary sewer, Riverton Dr. and D nby Ave. Sewer Dist. $19,749. L. Aldrich, City Hall, engr.

Calif., Oxnard—Sewage disposal plant, $125,280. Seeking FWA funds. E. O. Imus, City Hall, engr. Currie Engineering Co., Anderson Blvd., San Bernardino, consult. engr.

★**Mo., Wellston (St. Louis P. O.)**—Wellston Sewer Dist., of St. Louis Co., F. W. Homeyer, trustee, 6516 Easton Ave., St. Louis, Zone 14, voted $460,000 bonds, sanitary and storm sewerage sys., in 1,450 acre tract area bounded on south by north line of University City on north by south line of Curtis Sewer Dist. on east by western limits of St. Louis and on west by Hanley Rd. and hence diagonally northwest to Carsonville. Total est. $1,638,000. Will apply to FWA. E. A. Fulton, 3 S. Meramec Ave., Clayton, St. Louis, Zone 5, engr. CD 8/25—ENR 8/31.

Okla., Chickasha—City, J. Worley, mayor, outfall sewer. $110,000. S. E. Grimn, Chickasha, engr.

Okla., Henryetta—City, sanitary sewerage sys. imprvs. $25,000.

Ore., Tillamook—City, sewerage sys., interceptor and primary treatment plant. $75,000. U. E. Nelson, Ry. Exch. Bldg., Portland, engr. CD 8/21—ENR 8/24.

★**Va., Arlington**—Bd. Comrs. Arlington Co., Court House, sewage disposal plant addns. $600,000.

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SEWERS, WASTE DISPOSAL (Cont'd.)

Wash., Grandview—City, F. Elliott, mayor, sewer line. $70,000.

Ont., Atikokan—Municipality, sewerage sys. $60,000.

Ont., Kenora—Municipality, sewer exten. serving outlying dist. $50,000. J. A. McCombs, Town Hall, supt. and engr.

Ont., Sudbury — Municipality, sewage pump. station. $50,100. R. H. Martindale, City Hall, engr.

Que., East Angus—Municipality, c/o A. Tourigny, clk., sewerage sys. $30,000. Dpt. P. Health, Quebec City, engr.

Que., Nandville—Municipality, H. Larouche, clk., P. O. Box 120, Riverbend, sewerage sys. $35,000. Lavoie & Delisle, Chicoutimi, engrs.

Que., Quebec City—Municipality, F. X. Chouinard, city clk., pump. station, corner of Rousseau and Commissioners Sts., Quebec West., $40,000; sewerage pump. station, corner 13 St. and 4 Ave., in Limoilou, $40,000. E. Hamel, City Hall, engr.

BIDS ASKED

Bids Asked October 20

†**Md., Hyattsville**—At office Washington Suburban Sanitary Comn., P. Boswell, J. D. Clagett, and F. B. Smith, comrs., Hamilton St., 2,800 ft. 15 to 30 in. rein.-con. pipe drains, Contr. 1-D; plans deposit $5; adv. ENR 10/5.

LOW BIDDERS

†**Conn., Bridgeport**—F. Schwarzkopf, clk. Hy. Comn., City Hall, Sept. 26, storm and sanitary sewers, Conn. 6-107, Contr. 13, from Cecio Bros., 31 Grigg Ave., Greenwich, $134,907. CD 9/12—ENR 9/14.

CONTRACTS AWARDED

Mo., Springfield—City, O. L. Babbarick, comr., sewage disposal plant at airport, to D. R. Pray, Springfield, $29,500. L. A. Weeks, city engr.

★**Mich., Detroit**—Dpt. P. Wks., City Hall, 2 incinerator addns. at 24 and Central incinerator plants, to Nicholas Engrg. & Research Corp., 60 Wall Tower, New York, N. Y., $523,950. Bids 9/19. CD 8/29—ENR 8/31.

†**Utah, Ogden**—City, c/o City Recorder, sanitary and storm sewers, to Wheelwright Constr. Co., 2300 B. Avenue, $194,055. FWA, Bids 9/19, W. Templeton, city engr.

BRIDGES

PROPOSED WORK

Louisiana—State Dpt. Hys., Baton Rouge, constructing 8 spans to replace various bridges on U. S. 80, Dixie Overland Route between Arcadia and Minden. $200,000.

Ont., Picton—Prince Edward Co., Picton, bridge construction. $150,000. J. B. Dunkley, Co. Bldg., engr.

Ont., Walkerton—Bruce Co., Walkerton, bridge. $100,000. G. E. Stephenson, Box 398, engr.

Que., Arvida—Municipality, subway eliminating railroad crossing. $75,000. R. A. Lemieux, City Hall, in association with engineers of Canadian National R.R., H. A. Dixon, ch. engr., 360 McGill St., Montreal, engrs.

Que., Grande Vallee—Province of Quebec, Quebec City, replacing wooden bridge over Grande Vallee River. $30,000. Dpt. P. Wks., Quebec City, engr.

BIDS ASKED

Bids Asked October 10

Pennsylvania—J. U. Shroyer, secy. Hys., Harrisburg, rein.-con. bridge superstructure and rein.-con. paving 0.07 mi. Rural Route 13002, Lehighton Borough, Carbon Co. Plans deposit $2.50. (**Correction**—bid date). CD 9/26—ENR 9/28.

West Virginia—State Road Comn., Charleston, concrete substructure for Sandyville Bridge, S-1366, approx. three 60 ft. span, steel girder, Proj. 5406, Jackson Co.

Bids Asked October 13

New Mexico—State Hy. Dpt., Santa Fe, replacing timber floor on one steel span 96 ft. long and constructing 7 timber spans of 10 ft. to 15 ft. long, State Hy. Route 20 and 67, at Chaperito, San Miguel Co. F. G. Healy, engr.

Bids Asked October 13

Idaho—J. D. Wood, acting Comr. P. Wks., Boise, 24 ft. concrete bridge across Notus Canal on Hy. U. S. 20 near Caldwell, Canyon Co. Plans deposit $2.

Bids Asked October 17

Florida—T. A. Johnson, chr. State Road Dpt., Tallahassee, bridge across Dry Creek consisting of five 15 ft. spans of concrete deck on treated timber pile bents, State Proj., Job No. 5302-106, Road No. 20, Jackson Co.

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BRIDGES (Bids Asked, Cont'd.)

Indiana—State Hy. Comn., S. C. Hadden, chn., Indianapolis, raising 3 span 53 ft. steel girder structure, raising railroad tracks and paving approaches, structure on N. Y. Central Ry. where State Rd. 30 crosses tracks, Contr. 2540 Allen Co. Plans deposit $2.25; Bids Sept. 19 rejected. CD 9/5—ENR 9/7; constructing 2 span, 120 ft. rein.-con. arch bridge over Flat Rock Creek, State Rd. 40, 1 span, 48 ft. rein.-con. arch bridge extend. over Simons Creek, State Rd. 40, 1 span, 60 ft. rein.-con. arch bridge over Buck Creek, State Rd. 40, all foregoing in Henry Co. Plans deposit $2.75 each. R. Bower, Indianapolis, ch. engr.

CONTRACTS AWARDED

★**California**—State Div. Hys., Sacramento, reconstructing portion existing bridge over Sacramento River, Rio Vista, Sacramento Co., to Lord & Bishop, P. O. Box 812, and A. Teichert & Co., P. O. Box 1113, Sacramento, **$727,858.** Bids 9/13. CD 9/19—ENR 9/21, under LB.

Georgia—State Hy. Dpt., Atlanta, 1 main bridge and 2 overflow bridges at Ohoopee River and 0.68 mi. concrete paved approaches Swainsboro-Lyons Rd., to H. G. Smith, Fitzgerald, **$181,682.** Bids 9/15. CD 9/26.

Indiana—State Hy. Comn., S. C. Hadden, chn., Indianapolis, 2 span, 40 ft. bridge, 0.23 mi. approach grading paving Bridge Contr. 2542, Bartholomew Co., to R. L. Schutt, 215 E. New York St., Indianapolis, **$30,827.** Est. $36,287. Bids 9/19, awarded 9/25. CD 9/5—ENR 9/17.

B. C., Sooke—Province of British Columbia, Victoria, bridge over Sooke River, day labor. **$40,000** appropriated. Dpt. P. Wks., Victoria, engr.

STREETS AND ROADS

BIDS ASKED

Bids Asked After October 2

†**Tex., Temple**—U. S. Eng., Ft. Sam Houston, reconstructing pavement, etc., incl. 103,000 sq. yd. flexible base stabilizing new single asphalt surfacing 21,000 lin. ft. storm sewers, 20,000 cu. yd. open channel excav., etc. in McCloskey Hospital Zone, Serial No. W-41-154-45-27. Over $150,000.

Bids Asked October 9

New Jersey—S. Miller, Jr., comr. State Hy. Dpt., Trenton, grading, bituminous treated gravel surfacing 1.93 mi. Closure Roads at Naval Ammunition Depot, Park Ave. relocation at Area 2 and Jerseyville to East Freehold-Farmingdale Rd. at Area 3, in Middletown and Howell Twps., Fed. Proj. DA-NC-11, Monmouth Co. Plans deposit $10; penetration macadam and bituminous concrete paving, grading, etc., 1.28 mi. Constable Hook Access Rd. from 30 St. to southeasterly end of Hook Rd., Bayonne, Fed. Proj. DA-WI-19, Hudson Co. Plans deposit $10.

N. Y., New York—President Bronx Boro, Bronx County Bldg., 851 Grand Concourse, Zone 51. brick on concrete repaving E. 182 Folin and E. 150 Sts., sheet asphalt on concrete paving Claflin Webb and Sheridan Aves.

Bids Asked October 10

Massachusetts—Commonwealth of Massachusetts, Dpt. P. Wks., 100 Nashua St., Boston, bituminous road mix surfacing 10,655 ft. Wauquoit Rd., Mashpee. $70,000. Plans deposit $10.

Virginia—Commonwealth of Virginia, Dpt. Hys., Construction Engineer's Dpt., Richmond, soil surface treating 1.266 mi. Route 40, S.P. DA-WR-1407-M2,E, Fed. Proj. DA-WR 45-A(1), Nottoway Co.; rein.-con. pavement and bridge over Colonial Parkway, 0.095 mi. S.P. DA-NR 1177-5,B2, Fed. Proj. DA-NR 43-B(1), York Co.

Virginia—Dpt. Hys., Richmond, street and sidewalk, soil surface treating 1.266 mi. Route 40, Nottoway Co.; rein.-con. paving and bridge over Colonial Parkway, 0.096 mi. hy. York. Plans deposit $5, ($2.50 refundable), each. S. F. Stephens, engr.

Bids Asked October 11

Louisiana—State Dpt. Hys., Highway Office Bldg., Baton Rouge, 1,345 cu. yd. washed gravel to be furnished and delivered f.o.b. railroad cars at various sidings in St. James Parish, S.P. No. 703-00-96. D. Y. Smith, dir.

Louisiana—Dpt. Hys., D. Y. Smith, dir., Baton Rouge, bituminous surface treatment on gravel base course, drainage structures, shaping roadway, etc. 21.495 mi. State Routes 23 and 143, S.P. 737-00-11, Maneuver Area Roads (Group 6), Beauregard Parish.

Pennsylvania— J. U. Shroyer, secy. Hys., Harrisburg, bituminous on native stone or crushed aggregate surfacing, I-beam bridge, 0.24 mi U. S. Rte. 22, North Fayette Twp., between Bavington and Santiago, Allegheny Co.

Bids Asked October 12

New Mexico—State Hy. Dpt., Santa Fe, grading, surfacing, minor drainage structures and miscellaneous construction 5.1 mi. in Jim Lewis Canyon, DA-RM 87, Otero Co.; 2 course crushed gravel surfacing 7.5 mi.

LEADITE
The Pioneer Self Caulking Material for C. I. Pipe

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Nominal Inside dia. of pipe, in.	Depth of Joint, Inches of Leadite	Approx. lbs. of Leadite per joint	Depth of Joint, Inches of lead	Approx. lbs. of lead per joint
4	2.5	2.00	2.25	8.56
6	2.5	3.00	2.25	11.71
8	2.5	4.00	2.25	14.85
10	2.5	5.00	2.25	17.70
12	2.5	6.00	2.25	20.86
14	2.5	7.00	2.25	24.02
16	2.5	8.25	2.25	27.07
18	2.5	9.25	2.25	30.88
20	2.5	10.50	2.25	40.71
24	2.5	12.00	2.50	53.02
30	2.75	16.00	2.50	65.34
36	2.75	19.00	2.50	77.96
48	3.50	30.00	3.00	121.15
54	4.0	38.00	3.00	135.60
60	4.0	42.00	3.00	150.70

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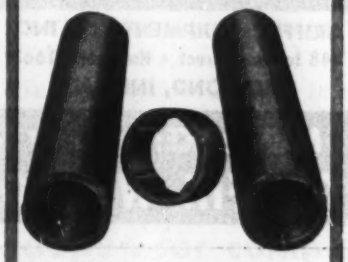

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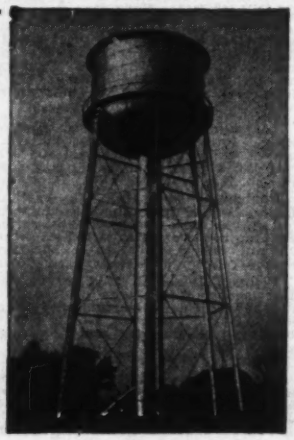

STREETS and ROADS (Cont'd, Bids As Oct. 12, Cont'd.)

State Hy. Route 120 between Holman a Chacon, State Proj. No. 309-A. Mora C grading minor drainage structures 1 m tiple span concrete box culvert over 20 clear span, base and top course surfac oiling, etc., 28.421 mi. State Hy. Route between Dora and New Mexico-Texas St Line, Roosevelt Co. F. G. Healy, engr.

Bids Asked October 17

Florida—T. A. Johnson, chr. State Dpt., Tallahassee, ocala rock base w bituminous retread surfacing 1.2 mi. a bituminous retread on existing brick pa ment with new rock base widening str 0.8 mi. between Automobile Drive a Myrtle Ave., State Proj. Job No. 7248-1 Road No. 4, Duval Co.; reworking exist Lime Rock Base and applying bitumi surface treatment 10.123 mi. between Di man's Bay and Road No. 500; State Pr Job No. 3807-102, Taylor Co.

Washington—B. Bantz, dir. hys., Olym grading, draining, constructing asphal concrete pavement and sidewalks, cem concrete curbs, and gutters approx. 1 mi. Primary State Hy. 14, Blacklack Cre in town of Port Orchard, Project DA-NR (2), Sec. 7 (reopened) and Sec. 1, Ki Co.; stockpiling mineral aggregates for N skid single seal treatment on Sec. 1, Prim State Hy. No. 2, and Secondary State H No. 2-A, Sect. 2, Primary State Hy. No. Sec. 3, Primary State Hy. No. 19, Sec Primary State Hy. 10, Brewster to Brid port in Douglas, Grant and Okanogan Co ties; crushed stone surfacing, light bitum ous surface treating, reconstructing exist culverts, constructing 88 ft rein.-con. gir bridge, 9.409 mi. Primary State Hy. 9, L Crescent Vicinity Sec. 2, Ulallam Co.; surf in- and stockpiling 6.22 mi. Secondary St Hys. Nos. 15-C and 15-D, Sec. 1, and Sec Chelan Co.; imprv. Primary State Hy 5, Lewis Co. Plans deposit $2.

Bids Asked October 19

Utah, Provo—City, I. G. Bench, c recdr., concrete and natural rock asph paving streets in Districts 32, 33 and $71,500. T. H. Latimer, City and Coun Bldg., city engr.

Bids Asked October 20

New York—H. A. Cohen, dir. Bureau C tracts and Accounts, State Dpt. P. W Albany, bituminous macadam penetrat method paving 4.17 mi. Seneca Lake S County Rd. 125, Contr. DA. SS. 44-6, 0.43 mi. Smith Vineyard Rd., Contr. SS. 44-7, both Seneca Co. Plans deposit each; C. H. Sells, supt. P. Wks.; adv. E 10/5.

Bids Asked

Connecticut—State Hy. Dpt., Hartford, ceived no bids Sept. 19, imprv. 1,13 hy. Derby, CD 9/15.

LOW BIDDERS

Calif., Los Angeles — Bd. Supervs. Angeles Co., Hall of Records, Sept. imprv. Washington Blvd., Constr. 538, f V. Kovacevich, 5400 Imperial Hy., So Gate, $39,234. CD 9/5—ENR 9/7.

Calif., Torrance—City, City Hall, Sept. grading, asphaltic concrete paving, T rance Blvd., from Tomei Constr. Co., Orion St., Van Nuys, $59,529. Est. $49,6 G. M. Jains, City Hall, engr.

Colorado—State Hy. Dpt., Denver, Se 27, imprv. 5.048 mi. San Miguel Co., fi Lowdermilk Bros., 140 S. Elati, Denver, $901. CD 9/21.

Idaho—J. D. Wood, acting comr. P. W Boise, Sept. 26, plant mix bituminous surf ing 2.259 mi. Overland and Vista Roa Whitney Beach, Ada Co., from Trian Constr. Co., 1707 Crescent Rim Drive, B $54,667.

Ill., Joliet—B. K. Preston, supt. hys. W Co., county Bldg., Sept. 26, imprv. 4 mi. co. roads, from Walsh Oil Co., 1 North Broadway, $124,399. CD 9/19—E 9/21.

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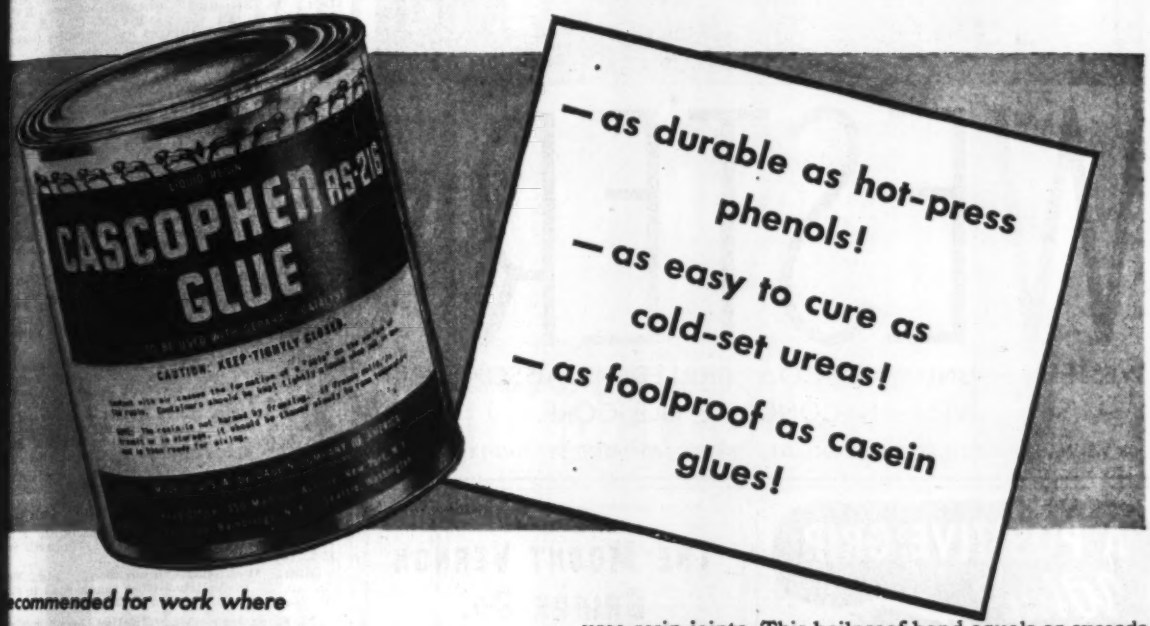
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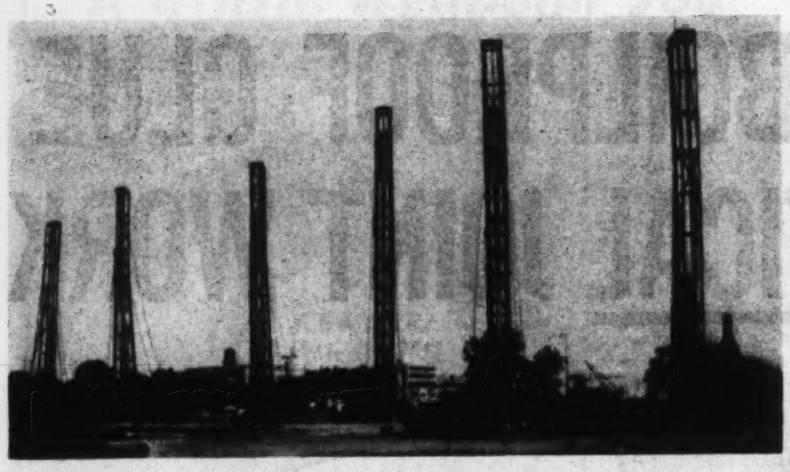

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STREETS and ROADS (Low Bidders, Cont'd.)

Kentucky — State Dpt. Hys., Frankfort, Sept. 29, imprv. roads, Group 3-C, Maintenance Projects, Henderson, Union and Webster Counties, from Lyon & Breeden, Rogersville, Tenn., **$111,396.** CD 9/13—ENR 9/21.

Md., Baltimore—City Bd. Awards, City Hall, Sept. 15, concrete paving, Contr. CC-31 from Paramount Constr. Co., 3700 Gough St., **$38,777.** CD 9/11.

Mass., Boston—City, Sept. 28, bituminous concrete paving Brookford, Dewey, Grafton, Howes, Mayfield, Romsey and Victor Sts., Ward 13, Maryland St., Wards 13 and 18, from S. J. Tomasello Corp., 15 Bay St., Dorchester, **$41,945.** CD 9/20.

Tenn., Knoxville—Dir. Pub. Serv., Sept. 20, stabilized concrete base surfacing streets in 6 housing various sections city, from Pittman Constr. Co., 537 Plaster Rd., Atlanta, Ga. **$62,540.**

CONTRACTS AWARDED

†**Calif., Barstow**—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash., 25, D. C. paving M C D S, NOY 10330 to D. A. Williams and Frontier Constr. Co., Whittier, **$28,000.**

Georgia—State Hy. Dpt., Atlanta, grading, surface treating 9.568 mi. Brunswick-Jesup Rd., to John Monaghan, Inc., Pelham, **$238,367.** Bids 9/15. CD 9/6.

Ill., Springfield—R. V. Tilly, county supt. hys., Sangamon Co., 316 N. Klein St., concrete paving, concrete curbing, sidewalks, grading 0.3921 mi. Sect. 62, M.F.T., S.A. Route 20, Woodside Twp., to I. D. Lain Co., 500 E. Capitol St., Springfield, **$46,947.**

Minn., Ortonville—G. W. Shaw, aud., Big Stone Co., graveling, about 44,600 cu. yd. roads, 264,700 cu. yd. mi. haul, to W. Hodgman & Son, Fairmont, **$32,246.** Bids 9/4. CD 8/30.

North Dakota—J. S. Lamb, comr., State Hy. Comn., Bismarck, imprv. 0/491 mi. hvy. WER 9C, Hettinger Co., and 0.379 mi. WER 24, State Hy. 6, Morton Co., to Rue Constr. Co., Bismarck, **$25,139** and **$25,498** respectively. Bids 9/29. CD 9/20.

Ohio—State Hy. Dpt., Columbus, asphaltic concrete resurfacing 25.056 mi. various sects. S.H. 128, U. S. 30-S, Allen and Hardin Counties, Proposal 1, to Churchill Const. Co., 1126 State St., Lima, **$77,451**; Proposal 2 to Ohio Road Improvement Co., Chamber of Commerce Bldg., Columbus, **$65,915.** Bids 9/15, CD 9/22—ENR 9/28, under LB.

Ore., Portland—City, W. A. Bowes, comr., City Hall, resurfacing streets, St. Johns Area, day labor. **$42,000.**

Pa., Phila.—City, Dpt. P. Wks., City Hall Annex, highway paving, repairs, to State Paving & Constructing Co., 1924 Arch St., **$32,710.** Awarded 9/27.

Man., Wekusko—Howe Sound Ltd., Wekusko, 30 mi. all-weather truck road to foot of Wekusko, day labor. **$30,000.**

N. S. Sydney—Municipality, street paving, day labor. **$50,000** voted. M. F. Cossitt, City Hall, engr.

EARTHWORK, WATERWAYS

PROPOSED WORK

Conn., Darien—Town, J. A. F. MacCammond, clk., preparing plans beach imprvs., incl. constructing parking area, cleaning shoreline and eliminating rocky condition on shore and in bathing areas, Tree Point, $25,000.

Pa., Youghiogheny—National Tube Co., F. Buchheit, asst. purch. agt., Frick Bldg., Pittsburgh, dredging, removing approx. 75,000 cu. yd. river deposit Monongahela River. $30,000.

N. S., Dartmouth—Dartmouth Ferry Comm., Dartmouth, imprvs. at Lake Banook, incl. 500 ft. retaining wall, widening, deepening Tittle River. $50,000 available.

BIDS ASKED

Bids Asked October 11

Illinois—Dpt. P. Wks. & Bldgs., Div. Waterways, 201 W. Monroe St., Springfield, rein.-con. cantilever type sea wall, etc., along east bank Fox River, adjacent to Illinois State Armory Bldg., Ottawa, La Salle Co., T. B. Casey acting ch. engr., adv. ENR 10/5.

Bids Asked October 17

†**Louisiana**—U. S. Eng., U. S. Post Office & Courthouse, Vicksburg, Miss., constructing approx. 70,000 cu. yd. earthwork on west bank of Red River, Red River Parish.

†**Mississippi**—U. S. Eng., U. S. Post Office and Courthouse, Vicksburg, approx. 1,146,000 cu. yd. or 1,547,000 cu. yd. under alternative plan of earthwork on east bank Mississippi River.

Bids Asked October 18

Ill., Charleston—City, c/o Hurst-Rochelle, consult. engrs., Hillsboro, 3 earthen dams, 1 with concrete spillway on Embarras River. **$165,000.**

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EARTHWORK, WATERWAYS (Cont'd.)

Bids Asked November 1

†Neb., Hemingford—Dpt. Interior, Bureau Reclamation, W. R. Young, acting ch. engr., Denver, Colo., furnishing, delivering, f.o.b. cars at shipping point or f.o.b. cars at Hemingford, two 10 ft. by 10 ft. radial gates with rollers, pin bearings, wall plates, sills and accessories, two 5,000 lb. capac. manually-operated, radial-gate hoists, complete with accessories for installation in headworks and sluiceway at Dunlap Diversion Dam, Mirage Flats Project, Spec. No. 1774.

LOW BIDDERS

†Ky., Hickman—U. S. Eng., P. O. Box 87, Memphis 1, Tenn., Sept. 25, constructing 1,800 lin. ft. woven lumber mattress revetment, on and adjacent to left descending bank of Island 8, chute of Mississippi River, approx. 10 mi. west of here, from Massman Constr. Co., 737 N. Y. Life Bldg., Kansas City, Mo., **$152,650.** CD 9/15.

†Mich., Saginaw—U. S. Eng., 700 Union Guardian Bldg. Detroit, dredging approx. 138 000 cu. yd. earth material from river channel and turning basin, in Saginaw River, from Margaret K. Carland, 505 N. Michigan Ave., **$41,400.** CD 8/22—ENR 8/24.

Pa., Phila.—Dpt. Wharves, Docks & Ferries, Sept. 25, bulkheading work repairs and addns. to municipal piers, from Thos. Eagle & Sons, Inc., Real Estate Trust Bldg., **$17,125.**

CONTRACTS AWARDED

†Missouri—U. S. Eng., P. O. Box 87, Memphis, Tenn., placing rip rap stone on riverside slope of levee and adjacent areas, Philadelphia Point and Dogtooth Bend, both Project R-32R. 1-A.C. to Markham & Brown and L. L. Sanders, Cape Girardeau, **$27,603.** Bids 9/19. CD 9/12—ENR 9/14.

★**Nebraska**—Central Nebraska Public Power & Irrigation Dist., C. B. Miller, pres., R. O. Canaday, secy., Hastings, completion of rip-rap on upstream slope of Kingsley Dam and abutments, Group 28 D-2 to Tobin Quarries, Inc., 220 W. 39 St., Kansas City, Mo., **$2,839,940.** Bids 9/22. CD 9/8—ENR 9/14.

Pa., Phila.—Dpt. Wharves, Docks & Ferries, drainage structures along Schuylkill River, to Kaufman Constr. Co., 1505 Race St., **$36,810.** Awarded 9/25.

LATIN AMERICA

Brazil, Salvador—A. Brasileira Ltda, Avenida Sete de Setembro 110, Salvador, Bahia, plans candy, biscuit, etc. plant exten. $4,000.

PUBLIC BUILDINGS

PROPOSED WORK

†Ala., Birmingham — Highland Avenue Baptist Hospital, 2236 Highland Ave., 1 story nurses' home, etc., Ala. 1-285-F $220,000. **FWA.**

†Ala., Gadsden—Missionary Servants of the Most Blessed Trinity, Gadsden, 2 story nurses' home, etc., Ala. 1-289-N. $150,000. **FWA.**

†Ala., Tuskegee — Tuskegee Institute, Tuskegee, nurses' home and training facilities, Ala. 1-293-N. $382,800. FWA.

Ala., Phenix City—Phenix City Comm., c/o Chairman, plans by Housing Architects of Columbus, 11 W. 12 St., Columbus, Ga., and bids soon brick hospital. $250,000.

†Ariz., Phoenix—Good Samaritan Hospital, 1033 E. McDowell St., dormitory and training facilities, incl. necessary auxiliary room, accommodating student nurses, Ariz. 2-164-N $225,000. **FWA.**

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...Lawndale—Lawndale School Dist., ...school, Calif. 4-436-F. $105,800.

...Lemon Grove—Lemon Grove School ...of San Diego Co., school addn., Calif. ...$53,000. FWA.

...Long Beach—Long Beach City ...Dist. of Los Angeles Co. and ...Beach City High School Dist. of Los ...Co., addns. to Thomas A. Edison ...entary School, Clara Barton, Lafayette, ...Elementary, Longfellow, John ...school, new 11 class room school, 3 ...addns. to Charles A. Lindbergh ...High School and new Junior High ...Calif. 4-621-N. $1,020,000. FWA.

...Pasadena — Pasadena Hospital ...Ltd., 100 Congress St., 2 story nurses' ...etc., Calif. 4-665-N. $97,500. FWA.

...San Francisco—St. Joseph's Hospi- ...Park Hill and Buena Vista Sts., ...homs, etc., Calif. 4-663-N. $97,500.

...Sacramento—Mercy College of ...Inc., 40 and J Sts., cadet nurses' ...and training facilities, Calif. ...$100,000. FWA.

...C., Wash.—Catholic University of ...420 Michigan Ave. N.E., 2 dormi- ...bldgs. and classroom bldgs. $148,000.

...C., Wash.—District Comrs., District ...1 story, dormitory, Gallinger Hospi- ...for student nurses, $99,000; also en- ...cafeteria, $11,000. FWA allot.

...Atlanta—Bd. Educ. plans by Shutze, ...rmistead & Adler, Candler Bldg., Boys ...School and Technical High School addn. ...Robert & Co., Bona Allen Bldg.,

...Savannah—Warren A. Candler Hospi- ...E Huntingdon St., nurses' home and ...facilities, Ga. 9-298-N. $243,000.

...Warner Robbins—Pub. Housing ...Georgia Savings Bank Bldg., Peach- ...and Broad Sts., Atlanta, bids soon dis- ...and ship 2 elevated steel tanks and ...from present location in Milwaukee, ...and Josephine, Pa., to here, furnish- ...certain replacement parts for 1 tank, ...erect new fdns., erection tanks and ...connecting tanks with existing water- ...etc. Plans deposit $25. J. N. Pease ..., Johnston Bldg., Charlotte, N. C.,

...Muncie—Ball Memorial Hospital ...Muncie, constructing 3 story, and ...floor nurses' home, Ind. 12-199-N. ...FWA.

...Council Bluffs—Sisters of Mercy, ...Bluffs, nurses' home, etc., Ia. 13- ...$45,000. FWA.

...Des Moines—Sisters of Mercy of ...Bluffs, 2 story, bsmnt., nurses' home, ...Iowa 13-143-N. $120,000. FWA.

...Sioux City — Methodist Hospital, 29 ...Douglas Sts., 1 story, part bsmnt. ...home, etc., Ia. 13-149-B. $41,000.

...Hamtramck (br. Detroit)—City, ...part bsmnt. nurses' home, etc., ...20-333-N. $59,300. FWA.

...Benton Harbor—School Dist. No. ...Benton Twp., 1 story, school addn., ...20-37 20-371-F. $52,200. FWA.

...Greenville—Dpt. Agriculture, U. S. ...of Plant Industry, Soils & Agricultural ...neering, c/o C. A. Bennett, engr., Green- ...cotton gin and press. $60,000.

...Pascagoula—City, 2 recreation ...addn. to beach pavilion, paving ...drives, parking areas, appurtenant ...Miss. 22-209-N. $150,900. FWA. CD ...NB 2/9.

...Joplin—St. John's Hospital, 2203 ...St., 1 story, bsmnt. nurses' home, ...23-305-N. $96,000. FWA.

...St. Louis—Sisters of St. Mary, 6240 ...Rd., 5 story, masonry, concrete ...home, etc., altering adjacent bldg., ...-301-N. $220,000. FWA.

...Hillsboro—Comrs. Hillsboro Co., plans ...Granger Associates, Main St., ...brick, steel courthouse addn., altera- ...$150,000.

...Cape May—City, City Hall, recon- ...convention hall and pavilion. $350,- ...R. Miller, City Hall, engr.

...York—U. S. Eng., 120 Wall St., New ...Sons 5, bids soon, chemical warehouse, ...Co. $70,000.

...Tompkinsville (sta Staten Island) ...Docks, Navy Dpt., 18 St. and ...Ave, N.W., Wash., 25, D. C., ...addns. storage bldg. $10,000.

...Concord—Cabarrus County Hospi- ...erecting, converting, equipping ...FHA demountable dormitories to pro- ...home and training school for ...N.C. 31-297-F. $95,400. FWA.

...Rugby—Good Samaritan Hospital ...2 story, bsmnt., nurses' home, ...concrete, N.D. 32-105-N. ...FWA.

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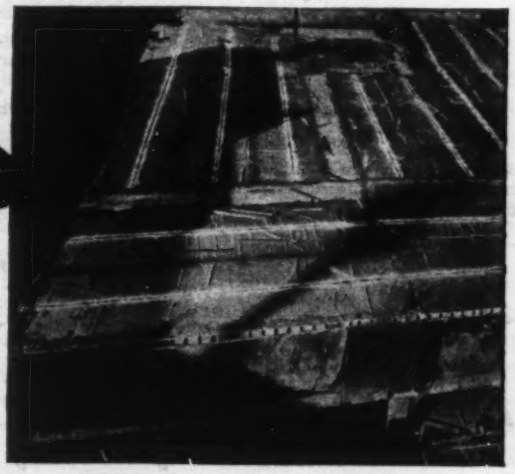

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PUBLIC BLDGS. (Proposed Work, Cost

O., **Columbus**—Franklin Twp. School D. $273,000 bond election in November, ac and Skidmore School addn.

★O., **Euclid (br. Cleveland)**—Euclid Educ., R. H. Erwine, supt., 1520 E. Ave., Cleveland, plans by H. A. Fulton, Euclid Ave., Cleveland, brick, steel, con high school, incl. stadium, athletic $850,000. Will apply to FWA.

†Ore., **Portland**—School Dist. 45, Port plans by Jones & Marsh, Woodlark B masonry addn. to Gilbert School, De 35185-N. $16,944. FWA.

★†Pa., **New Castle**—Pub. Housing A NHA, 270 Bway., New York, 7, N. 350 unit family stop-gap housing, 36446. $1,260,000. CD/25—ENR 9/21.

†S. C., **Anderson**—Anderson County H tal Assn., Anderson, nurses' home, etc., 38-242-N. $117,280. FWA.

†S. D., **Aberdeen**—St. Luke's Hospital, S. State St., 2 story, bsmnt. nurses' addn., masonry, concrete, S.D. 38-1 $120,000. FWA.

†Tex., **McGregor**—Pub. Housing A NHA, 1205 Electric Bldg., Seventh and lor Sts., Fort Worth, Zone 2, cancelled to have been opened October 2, 125 por shelter units, Tex. 41-662. CD 9/21.

★†Virginia—Norfolk County School Portsmouth, 7 schools, etc., in served by Norview, Coleman Place, B Creek and Ingleside Schools, Va. 44-1 (revised), Norfolk Co. $701,000. FWA

†Va., **Alexandria**—Alexandria Hospital, Duke St., 2 addnl. stories on east win hospital for nurses' home, Va. 44-4 $54,000. FWA.

Va., **Lynchburg**—City Manager, ★Hall, high school. $1,000,000.

†Wash., **Port Townsend**—School Bd., Townsend, plans by F. B. Stephen, S Tower, Seattle, Zone 4, 80x60 ft., nursery, Wash. 45303-N. $30,000. FWA

†Wash., **Seattle**—Virginia Mason Hos Assn., 1101 Terry St., 2 story, part ba nurse's dormitory and school, Wash. 45 N. $163,700. FWA. CD 4/19—ENR 4/2

†Wash., **Spokane**—Sisters of House Providence, State of Washington, constr ing, equipping nurses' dormitory, Wash. 45-310-N. $110,280. FWA.

†Wash., **Tacoma**—Tacoma General Ho tal, 315 S. K St., constructing, partial e ping 4 story, bsmnt. nurses' home and sc Wash. 45-307-N. $375,000. FWA.

Alta., Coleman—Municipality, munic district hospital. $150,000.

B. C., Burnaby (Postal Dist. Vancouv—Dominion Government, Dpt. P. Wks., Ott Ont., bids soon health and occupational tre for 200 convalescent war veterans, 340 acre site at Sound end of Burnaby L $300,000. Dpt. Pensions & National Ho MacKenzie Ave., Ottawa, Ont., archts. P. Wks., Hunter Bldg., Ottawa, Ont.

Man., St. James (Postal Dist. Wi peg)—Municipality, Town Hall, additio 3 bowling alleys in bsmnt. and badmi courts in center portion, Oakdale $175,000.

Man., Winnipeg—Province of Manit Winnipeg, plans Ministry of Health, Wi peg, Central School for Deaf. $200,000. P. Wks., Winnipeg, engr.

Ont., Fort William—Municipality, mech cal repair shop, etc. $75,000. H. M. W house, City Hall, engr.

Ont., Ottawa—Public School Bd., Glin St., Elmdale school addn. $150,000.

★**Ont., Toronto**—Wartime Housing Ltd., York St., 100 temporary houses, on f of park lands, principally Earlscourt, Re and Stanley Parks. About $500,000.

Ont., Toronto—University of Toronto, ronto, new central heating and power pl $100,000.

Ont., Toronto—Wellesley Hospital, Homewood Pl., nurses residence. $18

Que., Arvida—Municipality, city h $125,000; arena, $100,000. R. A. Lem City Hall, engr.

Sask., Regina—Province of Saskatchew c/o Dpt. Agriculture, Regina, horse pro ing plant. $50,000 initial cost. Dpt. Wks., Regina, archt.

†**Alaska, Fairbanks** — Federal Wo Agency, 18 and F Sts. N.W., Wash., D. C., two 1 story, bsmnt. wings to rec tion bldg., Alaska 50-161-F. $31,000.

BIDS ASKED

Bids Asked October 9

†N. Y., **Syracuse**—Bd. Trustees Syra University, Syracuse, laboratory and cl room, N. Y. 30-254-N. $50,000. FWA. tended date. Biggers & Higgins, 542 5 New York, Zone 19, archts. CD 9/13—E 9/21.

Bids Asked October 11

†**Va., Arlington**—Yards & Docks, Navy D 18 St. and Constitution Ave., N.W., Wa 25, D. C., addnl. housing and recreation fa ities, for Marine Corps Women's Reser Spec. 14501, NOY 10059, $300,000. A. R. M 728 17 St., N.W., Wash., D. C., archt. 8/10.

Bids Asked October 13

†**Ga., Columbus**—City of Columbus Hou Auth., 1100 27 St., 160 family dwelling u and community bldg., Ga. 4-5, for NHA. P deposit $15. Biggers & Lockwood, Mu Bldg., archts. Extended date. CD 9/19—E 9/21.

PUBLIC BUILDINGS (Cont'd.)

Bids Asked October 12

...Marietta—Pub. Bldgs. Admin., 13 and ...St., N.W., Wash., 25, D. C. 1 story 98x139 ...junior high school. R. R. Nash, Mosley ...Marietta, archt CD 7/13—ENR 7/20.

...Sault Ste. Marie—A. N. Langius, dir. ...Administrative Bd., Lansing, Zone 13, ...constructing and rehabilitation work at ...U. S. Hospital at Fort Brady. $151,- ...D. F. Anderson, Marquette, archt.

Bids Asked October 17

...Springfield—J. W. Kapp, Jr., mayor, ...Hall, installing steam generator unit, ...basis of generating 300,000 lbs. steam per ...at present Lakeside Plant, 5 mi. south ...here, for City Water, Light & Power Co. ...,000. Burns & McDonnell Engr. Co., 107 ...Linwood Blvd., Kansas City, Mo., engrs.

Bids Asked October 23

...C. Mason—Bd. Educ. Caswell Co., c/o ...Superintendent of Public Instruction, Yanceyville, school L. M. Gudger, 52 Carter St., ...Martin, archt. Plans deposit $25, $15 for ...heating and electrical work.

Bids Asked October 24

...Birmingham—Pub. Housing Auth., ...Georgia Savings Bank Bldg., Peachtree ...Broad Sts., Atlanta 3, Ga., child's care ...addn. to community and storage bldgs., ...appurtenances for war housing, Ala. ...D. C. Whilldin, 1606-0 Empire Bldg.,

Bids Asked

...Bridgeport—Pub. Housing Auth., ...14 School St., Boston 8, Mass., site ...grading, drainage work, Lincoln ...Project, Conn. 6054. Lindsay & ...111 State St., archt. CD 8/23—

...Waterbury—Pub. Housing Auth., ...14 School St., Boston, Mass., grading, ...work, site imprvs., Conn. 6043. J. F. ...Belden Hill, Wilton, archt. CD ...—ENR 9/28.

...W BIDDERS

...New Orleans—Consolidated Vultee ...Corp., 7020 Franklin Ave., Sept. 25, ...assembly plants, from R. P. Farns- ...& Co. Inc., 1515 S. Salcedo St., $115,- ...Defense Plant Corp. will finance. CD 9/19 ...ENR 6/22.

...Aberdeen—U. S. Eng., Standard Oil ..., Baltimore, Sept. 23, 120 test blocks ...1 buffing slab, from Lycoming Constr. ..., 127 Susquehanna St., Williamsport, Pa., ...CD 8/4—ENR 8/10.

...Rolla—Bureau of Mines, Dpt. In- ..., Rolla Sept. 21, 4 story, bsmnt., 53 x 100 ..., brick, concrete ferro-alloy pilot plant or ...wing 3 story, bsmnt., 60 x 53 ft., or ...two wings, 3 story, bsmnt., 53 x 60 ft., ...Simon Constr. Co., Columbia, $166,965 ...bid (portion 4-B 53 x 100 ft.) H. P. ...kins, 10 E. Mulberry St., Baltimore, Md.

...NTRACTS AWARDED

...Calif., Mare Island—Yards & Docks, Navy ...Dpt., 18 St. and Constitution Ave. N.W., ...Wash., 25, D. C., Hamoja Housing, Navy ...Yard, Spec. 10436, to J. H. Pomeroy & Co., ..., 321 Montgomery St., San Francisco.

...Calif., Mare Island—Yards & Docks, ...Navy Dpt., 18 St. and Constitution Ave. ...W., Wash., 25, D. C., joiner and machine ...shop at Naval Ammunition Depot, Spec. ..., NOY 8321, to James I. Barnes Constr. ..., 941 Russ Bldg., San Francisco, $666,000 ...Item 1). Bids 9/7. CD 9/15.

...Calif., San Diego—Yards & Docks, Navy ...Dpt., 18 St. and Constitution Ave. N.W., ...Wash., 25, D. C., 17 wood frame temporary ...dwellings, N.R.B. Spec. 14223, NOY 9733, to ...Griffith Co., 1640 S. Bway., Los Angeles, ...,000. Bids 9/25. CD 9/23, under LB.

...D. C., Anacostia—Yards & Docks, Navy ..., 18 St. and Constitution Ave. N.W., ...Wash., 25, D. C., explosives bldg., NOY 10455, ...John Tester & Son, 1427 Eye St. N.W., ...Washington 5, $49,548. CD 9/5—ENR 8/17, ...under Bellevue.

...Mich., East Detroit—Bd. Educ., East De- ...troit, brick, steel, concrete, school and school ...addn., to M. E. Greenberg Co., 300 Transpor- ...tation Bldg., Detroit, $179,297. Bids 9/9 ...CD 9/11.

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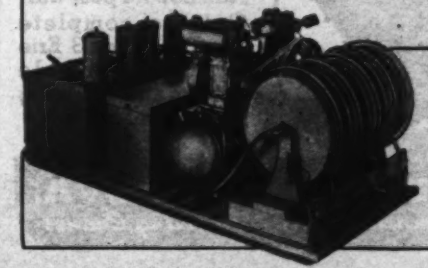

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PUBLIC BUILDINGS (Contracts Awarded Cont'd.)

★†**Neb., Hastings**—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash., 25, D. C., drill and fixing bldgs., Naval Ammunition Depot, NOY 10713, to Maxon Constr. Co., Inc., 131 N. Ludlow St., Dayton, O., $500,000.

†**N. J., Dover**—U. S. Eng., 120 Wall St., New York 5, N. Y., 10 miscellaneous armament bldgs., to A. A La Fountain, Inc., R. D. Ave. and Beech St., Hackensack, $200,000. CD 9/15—ENR 9/21.

†**N. J., Earle**—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash., 25, D. C., plant and erosion control, Magazine Cover, Naval Ammunition Depot, NOY 10929, to Mutual Contg. Co., Inc., 62 Bay Ave., Atlantic Highlands, $172,800.

★†**Ore., Springfield**—Defense Plant Corp., 811 Vermont Ave. N.W., Wash., 25, D. C., wood waste alcohol plant, to Ford J. Twaits Co., Dexter Horton Bldg., Seattle 4, Wash., and Industrial Engineers & Contractors, 711 Middle Waterway, Tacoma, Wash. Est. $1,185,000.

†**Pa., Chester**—Pub. Housing Auth., NHA, 270 Bway., New York 7, N. Y., community bldg. for federal housing to A. P. Miller and Anthony P. Miller, Inc., 3333 Arctic Ave., Atlantic City, N. J., $225,000. Awarded 9/25.

†**Pa., Middletown**—U. S. Eng., Standard Oil Bank Bldg., Baltimore, Md., vehicle and motorized equipment repair shop, to Ritter Bros., 1511 N. Cameron St., Harrisburg, $191,900. CD 8/2—ENR 8/10.

†**Pa., Williamsport**—Lycoming Div. Aviation Mfg. Corp., 1515 Park Ave., laboratory to Brown & Matthews, Inc., 122 E. 42 St., New York, N. Y. $327,346. Defense Plant Corp. will finance. Bids 9/12. Awarded 9/18. CD 9/8—ENR 8/31.

†**Tex., Houston**—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash., 25, D. C., Waves and corpsmen barracks, technicians quarters, U. S. Naval Hospital, to W. S. Bellows Constr. Co., Bankers Mtg. Bldg., Houston, $395,855. CD 8/1.

†**Va., Norfolk**—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash., 25, D. C., exten. Unit P power plant, Naval Operating Base, Spec. 15061, NOY 10471, to Harry R. Byers, Inc., Shoreham Bldg., Wash., D. C., $337,165. Bids 9/14. CD 9/11.

★**B. C., Vancouver**—Dpt. National Defense (Sea), Ottawa, Ont., naval depot, to British Columbia Bridge & Dredging Co. Ltd., 675 Hastings St., $1,400,000.

N. B., Sussex—Dominion Government, Ottawa, Ont., heating plant, to Parsons Constr. Co. Ltd., Imperial Bldg., Moncton, $65,000.

Ont., London—Dpt. P. Wks. Ottawa, Ont., health and recreation center, at Westminster Hospital, to L. C. Scott Co. Ltd., 330 Bay St., Toronto. About $475,000. Bids 9/19. CD 9/5—ENR 9/7.

Ont., Toronto—Dpt. P. Wks., Ottawa, structural steel work for active treatment and outpatients bldg. at Sunnybrook Park Hospital, to Central Bridge Co. Ltd., 300 West St., Trenton, about $160,000. CD 9/20—ENR 9/28.

Ont., Toronto—Wartime Housing Ltd., 9 York St., 100 temporary prefabricated houses to Halliday Co. Ltd., 69 Ontario St., Burlington, $235,000. CD 9/5—ENR 9/14.

COMMERCIAL BUILDINGS

PROPOSED WORK

Ind., Indianapolis—Hoosier Mortgage Co., Geo. E. Weidlich, pres., State Life Bldg., residences, Remster Estate. $200,000.

Me., Houlton—Ricker Classical Institute, High St., soon lets contract foundations for arts and science wording hall, incl., library and laboratory bldg. alterations, addns. $150,000. A. J. Harriman, 88 Shepley St., Auburn, archt.

Mass., Fall River—Truesdale Hospital, 1820 Highland Ave., plans by E. I. Marvell, 309 Bedford St., brick, steel nurses home, Highland Ave.

Mass., Holyoke—Young Men's Christian Assn., 347 High St., plans by Y.M.C.A. Natl. Bldg. Bd., 347 Madison Ave., New York, N. Y., and Tessier & Maloney, associated archts., 320 Dwight St., Springfield, brick, steel, YMCA bldg., Pine St. $400,000. CD 1/6—ENR 1/13.

N. J., Bloomfield—Essex Housing Corp., 17 Academy St., Newark, plans by W. Lehman, 972 Broad St., Newark, 100 suits, 2 story, brick veneer, garden apartments, $150,000.

Tenn., Memphis — John Gaston Hospital, 860 Madison Ave., bids soon, rein.-con., steel, brick addns., remodeling John Gaston Hospital. $375,000. Schulz & Norton, Shrine Bldg., engrs.-archts.

★**Tex., Harlingen**—Casa La Guerra Corp., c/o C. Carruth, 101 E. Van Buren St., plans by L. Ellis, Merchants National Bank Bldg., Brownsville, 36 dwellings, concrete fdns., etc., $550,000.

MERCIAL BUILDINGS (Proposed Work, Cont'd.)

...Ottine—Texas Elks Crippled Chil... Institute, Inc., (B.P.O.E.), San Jacinto ..., Houston, at Seguin, soon lets contract, ...nits) and allied facilities, etc., $150,000. ...nded date. J. M. Marriott, 239 Frost ..., San Antonio, archt. CD 9/30—ENR ..., under Gonzales.

...W. Va., Huntington—St. Mary's Hospital, ...ington, hospital and medical center. ...,000.

...Ont., Niagara Falls—Robertson Construc... & Engineering Co. Ltd., 2 Clifton Ave., ...dwellings. $300,000.

...Ont., Ottawa—Jewish Community, c/o A. ...berman, 7 Beechwood Ave., Eastview, ...munity centre. $400,000.

...Que., Lachine—G. F. Renuard, 9 39 Ave., ...s by P. Colangelo, 1540 Stanley St., Mon... ..., cottages. $350,000.

...G ASKED

Bids Asked October 9

...S. D., Beaver Falls—Providence Hospital, ...R. Ray, pres., 503 6 St., New Brighton, ...ter, bsmnt., 50x56 ft., brick, tile hospi... ...gable. $160,000. Carlisle & Sharrer, Mar... Bldg., Pittsburgh, archts.

Bids Asked October 21

...Ala., Monroe—St. Francis Sanitarium, Mon... 1 story, 46x135 ft. nurses school, with ...0 ft. wings. $150,000. H. H. Land, 1104 ...ahn Bank Bldg., archt.

...NTRACTS AWARDED

...N. C., Raleigh—Bd. Trustees Rex Hospital, ...C. C. F. Gaddy, supt., St. Marys St., hos... ...gala, to T. A. Loving & Co., Goldsboro, ...,241. Bids asked 9/26. CD 9/26—ENR ...

...Va., Danville—Geo. F. Geisinger Memorial ...pital, Danville, boiler house, power house, ...dorial Constr. Co. Forty Fort; mechan... ...work, to D. J. Keating, 613 S. 24 St., ...a. $180,000. Bids 9/7. CD 9/1—ENR ...

...Ky., Keene—Southwestern Jr. College, ...1 story, 42x216 ft. boys dormitory, ...concrete, hollow tile, subcontracts. ...,000. CD 9/1—ENR 9/7, under CA.

INDUSTRIAL BUILDINGS

...POSED WORK

...Ark., Blytheville—COTTON GIN—New ...e Gin, c/o C. Caldwell & J. W. Mahan, ...theville, cotton gin. $50,000.

...Colo., Denver—WAREHOUSE, etc.—W. H. ..., archt., 2048 Dahlia St., soon lets ...ract 1 story, 135 x 225 ft., brick, steel ..., pre-cast concrete warehouse, offices ...loading docks, for Goldberg Bros., 1535 ...e St. $75,000. CD 7/26—ENR 7/27.

...Conn., East Hartford (br. Hartford)—...T UNIT—Hamilton Standard Propellers ..., United Aircraft Corp., F. G. Watts, ..., 400 Main St., soon lets contract, 1 story ...x 112 ft., concrete, steel test unit. Over ...,000. Albert Kahn Associated Architects ... Engineers Inc., 345 New Center Bldg., ...roit 2, Mich., engrs.

...Conn., New Haven—TRUCK TERMINAL—...ville Trucking Co., 563 Central Ave., 1 ..., 64x125 ft., cinder blocks masonry ...t terminal Central Ave. $40,000.

...Conn., New London—DAIRY—New London ...hegan Dairies, Inc., 73 Jefferson Ave., ...tory, 75x90 ft., brick, concrete dairy ..., rejected 8/1 bids. Payne & Keefe, 231 ... St., archts. CD 7/26—ENR 7/27.

...Conn., New London—SERVICE STATION ... A. Schaller, 939 Bank St., preparing ...e 1 story, 75 x 100 ft., brick, steel serv... ...station, $40,000.

...Md., Baltimore — PLANT — Henschein, ...is & Crombie, archts., 59 E. Van ...n St., Chicago, Ill., at office of owner, ... lets contract, beef killing plant, for ...derberg-Kurdle Co., Baltimore and ...n Sts. CD 9/26—ENR 9/28.

...Mich., Detroit—PRESS—Giffels & Vallet, ..., 1000 Marquette Bldg., soon lets con... brick, steel, rein.-con. press bldg., for ... Wheel Co., 12141 Charlevoix Ave. ...,000.

...N. Y., Ballston Spa—PLANT—American ... & Leather Co., Inc., Ballston Spa., soon ...contract, factory addn. $250,000. Plans ...ect $25. Kiss & Holroyd, 257 Bway, Troy, ... and archts. CD 9/13—ENR 9/21.

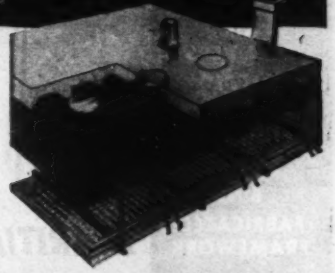
...Ohio, Akron—LABORATORY—General Tire ... Rubber Co., 1709 E. Market St., 1 story, ... steel, concrete research laboratory, ...,000.

...Ohio, Myrtle—FACTORY—Bendix Westing... Automotive Airbrake Co., Cleveland ...factory, alterations, platform stores... ..., etc. $130,314.

...Ohio, Marysville—FACTORY—H. B. Salter ... Co., Marysville, copper and bronze ...gs mfg. plant. $107,129.

...Penn., Perry—STORAGE—Stauffer Chemical ...20 Lexington Ave., New York, N. Y., ...ic soda, etc., storage bldg., tanks. ...,000.

...Penn., Springfield—PLANT, etc. — National ... Co., Grant Bldg., Pittsburgh 30, ...Bldg., installing bridge crane, Monorail ... $343,000.



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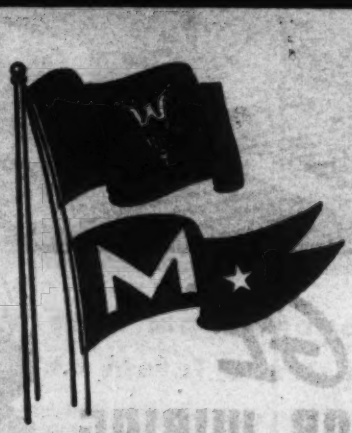

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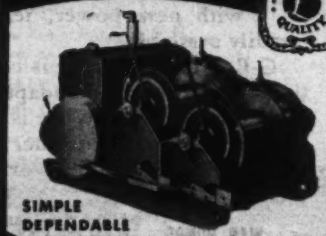

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INDUSTRIAL BUILDINGS (Proposed Work Cont'd.)

O., Toledo—FACTORY—Art Iron & Wire Works, Inc., Curtis St., 1 story, 61x120 ft. brick factory addn. $40,000.

O., Toledo—WELDING BOOTHS, etc.—Willys-Overland Motors, Inc., W. B. Corbett plant supt., Wolcot Bldg., welding booths with exhaust sys. ($3) and installing conveyors, new lighting equip. $79,092.

O., Zanesville—FACTORY—Timken Roller Bearing Co., 1835 Dueber Ave. S.W., Canton, remodeling factory, installing conveyors, plumbing, etc. $40,000.

Ore., Portland — FACTORY — American Linen Co., 210 W. 155 St., New York, N. Y., plans by Barrett & Logan, 1940 S.W. 4 Ave., linen supply factory, Harrison and S.W. 8th St. $250,000.

Pa., Conshohocken—FACTORY—Lee Rubber & Tire Corp., Conshohocken, 2 story, bsmnt., 96 x 40 ft. factory, with racks and conveyors, $282,000.

Pa., Economy—PLANT—A. M. Byers Co., W. T. Case, plant engr. in charge, Duss Ave., Ambridge, completed plans 1 story, 70x1[illegible] ft., steel frame, wrought iron siding pickling bldg. at plant site. $90,000.

Pa., Springdale—PLANT—Pittsburgh Plate Glass Co., H. B. Higgins, pres., Grant Bldg., Pittsburgh, paint plant.

Pa., Saegerstown—SUBSTATION—Gibbs & Hill, engrs., Pennsylvania Station, New York, N. Y., soon lets contract, electric substation, steel, incl. three 5 x 5 transformers, for Northwest Rural Elec. Co-operative Assoc., C. Hecker, supt., 246 Main St., Cambridge Springs.

Tenn., Memphis—PLANT—Abraham Bros., G. G. Abraham, vice pres. Hollywood Station, Memphis, plans by H. P. Henschel, 59 E. Van Buren St., Chicago, Ill., 1 story rendering plant. $100,000. H. Hunter, 1[illegible] Tutwiler St., engr.

Tex., Donna—PLANT—Knapp Bros. et al., Sherriff & Koehle, Donna, 2 story citrus and vegetable packing plant, $45,000.

Tex., Edinburg—PLANT—H. ROUW Co., Edinburg, 1 story, brick, rein.-con. citrus packing plant addn., $40,000.

Tex., McAllen — SERVICE & STORAGE BLDG.—Mrs. I. G. Cook, S. 10th St., McAllen, brick, rein.-con. service and storage bldg. $40,000.

Tex., Mercedes—PLANT—Roi Fooda, Inc., Mercedes, citrus and vegetable processing plant unit, $40,000 or more.

Tex., Mission—PACKING PLANT—Schmidt Packing Co., Mission, 2 story, brick, rein.-con., etc., citrus packing plant unit, $45,000.

Tex., Mission—PACKING PLANT—Mahl & Co., Mission, 2 story, brick, rein-con. citrus packing plant, $40,000.

Tex., Houston — PLANT — Daniel Orifice Fitting Co., 103 Portwood St., 50x146 ft. brick, hollow tile, concrete plant bldg., 5300 Blk. Clinton Dr. $40,000.

Tex., Houston—ROUNDHOUSE—Southern Pacific Lines, R. W. Barnes, ch. engr., Southern Pacific Bldg., Zone 1, roundhouse unit, $55,000.

Tex., Santa Rosa—PLANT—Santa Rosa Ice Co., c/o C. C. Daniels, Edcouch, 2 story ice plant, brick, rein.-con. $40,000.

Wash., Seattle — WAREHOUSE — Northwestern Glass Co., 5801 E. Marginal Way, warehouse. $61,207.

Wash., Vancouver—STORAGE BIN—Columbia River Paper Mills, 515 Oregon Bldg., Portland, Ore., chip storage bin. $[illegible] $97.

Man., Winnipeg—PLANT—Auto Body Works, Ltd., 261 Burnell St., plant, $40,000.

Newfoundland, Curling — PLANT — C. Crosbie, Curling, herring, oil and meal plant, $40,000.

Newfoundland, St. Johns—PLANT—Newfoundland Industrial Development Bd., c/o L. J. Harnum, secy., fish by-product mfg. plant, also meat and fish curing plant, $50,000.

Ont., Dobie — DIAMOND DRILLING — North Whitney Mines Ltd., Suit 403, 100 Adelaide St., Toronto, diamond drilling. Over $30,000.

Ont., Porcupine—DIAMOND DRILLING—Goldarea Prospecting Syndicate, 200 Bay St., Toronto, minimum 10,000 ft. diamond drilling, etc. $50,000.

Ont., Toronto—PRINTERY, etc.—Canadian Builder Publishing Co. Ltd., c/o A. J. Mortimer, 320 Bay St., printery, etc. $40,000.

Ont., Toronto—PLANT—Sterling Paper Boxes, Ltd., c/o H. A. Coon, Federal Bldg., mfg. plant. $40,000.

Que., Chicoutimi—PLANT—La Brasserie du Saguenay, Inc., Chicoutimi, cleaning & dyeing plant. $40,000.

★ **Que., LaTuque**—MILLS—Brown Co., LaTuque, mills exten. $3,000,000. (10/1/26—ENR 2/3.

Que., Montreal — PLANT — Aluminum Works, Ltd., c/o G. Joyal, St. Antoine & Longueil, plant. $40,000.

Sask., Regina—BREWERY—Regina Brewing Co. Ltd., R. A. Healy, secy., Dewdney & Toronto Sts., 2 story, brick brewery addn. $50,000.

B. C., Victoria—SAWMILL—Coal Creek Tie Co. Ltd., Union Bldg., sawmill, shingle mill, tie mill.

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INDUSTRIAL BLDGS. (Bids Asked, Cont'd.)
BIDS ASKED

Bids Asked After October 1

Tex., Madisonville—PLANT—General Box Co., Madisonville, plant. Over $40,000. CD 7/21—ENR 8/3.

Bids Asked

Tex., Robstown—PLANT—Stanolind Oil & Gas Co., Gulf Bldg., Houston, and Seaboard Oil Co. of Del., Continental Bldg., Dallas, pressure maintenance plant, $100,000. CD 5/24—ENR 6/8.

Tex., Seminole—PLANT—Southern Carbon Co., Seminole, carbon black plant unit, $250,000. CD 9/20—ENR 9/28.

Ont., Toronto — PLANT — J. B. Parkin, archt., 96 W. Bloor St., plant, for Can. Doughnut Co. Ltd., 127 Dufferin St. $40,000.

Que., Iberville—J. E. A. Benoit, archt., 110 Champlain St., St. Johns, 1 story, 30x160 ft., factory, 1 story, 32x30 ft. boiler house, 1 story, 30x32 ft. garage, 1 story, 30x50 ft. dining room, brick, structural steel, concrete fdns., for Lord & Breu, Iberville. $50,000.

LOW BIDDERS

Colo., Denver—PLANT—Union Pacific System, B. H. Prater, ch. engr., 1416 Dodge St., Omaha, Neb., Sept. 26, 1 story, 133x140 ft., hollow tile or brick plant, from F. J. Kirchhof Constr. Co., 700 Lawrence St., $51,897. CD 9/19—ENR 9/21.

CONTRACTS AWARDED

Colo., Denver—BUS DEPOT—Rio Grande Motor Way, Inc., 1726 Champa St., 84 x 100 ft. bus depot, to Short & Bundgaard, 11 E. 4 St., $65,000.

Mass., Mansfield—FACTORY—F. C. Brodie Co., Central St., rebuilding, remodeling, alterations 1 story, monitor type, 90x165 ft., brick, concrete factory, to Walter H. Barker, Inc., 23 Main St., Taunton. Est. $40,000.

Mass., Springfield—FACTORY—Van Norman Co., 3640 Main St., Springfield, 1 story, brick, steel factory addn., to Ley Constr. Co., 1215 Main St., $46,900.

Md., Baltimore — PLANT — Westinghouse Electric & Mfg. Co., Union Bank Bldg., Pittsburgh, Pa., altering, changes, building A, to Morrow Bros. Inc., 2315 N. Charles St., $50,000.

Md., Sparrows Point (br. Baltimore)—STORAGE BLDG.—Bethlehem Steel Co., Sparrows Point, 2 story, brick, steel, concrete, mould storage addn. to Morrow Bros. Inc., 2315 N. Charles St., Baltimore, $40,000. CD 8/22—ENR 8/24.

Minn., Minneapolis—PLANT—Toro Mfg. Corp. of Minnesota, 3042 Snelling Ave., general contract, 1 story, 164 x 180 ft., masonry, steel warehouse addn., to H. K. Lindahl, 3744 17 Ave. S., $75,000. G. W. Shiffler, 33 S. 9 St., archt. CD 11/23—ENR 12/9.

N. J., Kearny (br. Arlington)—STORAGE—Celutone Co., 1100 Harrison Ave., 1 story, concrete block storage bldg., to H. Nonamaker, 12 Oakland Rd., Maplewood, $40,000. E. B. Torrence, 42 Terrace Pl., Arlington, archt.

N. J., Perth Amboy—PLANT—General Cable Corp., 26 Washington St., interior and exterior alterations to factory, to Michael Riesz Co., 871 King Georges Rd., Fords, $40,000. CD 9/11—ENR 9/14.

★**O., Cleveland** — FACTORY — Cleveland Diesel Engine Div. of General Motors Corp., L. W. Bauman, ch. engr., 2160 W. 106 St., design and construction 1 story, 300x490 ft., brick, steel, concrete, factory addn., to Austin Co., 16110 Euclid Ave. Est. $530,000.

O., Cleveland—FACTORY—E. L. Mustee & Sons, 2022 W. 28 St., masonry contract. 1 story, 60x160 ft. brick, steel factory, to J. Kutnick, 1069 Thornhill Dr., Est. $40,000. F. W. Mettler, 4004 Bluestone Rd., engr.

O., Cleveland—KILNS—White Sewing Machine Co., 1300 Washington Ave., kilns in present bldg., to Sam. W. Emerson Co., 1836 Euclid Ave. Est. $40,000. McGeorge & Hargett, 9400 Quincy Ave., engr.

O., East Liverpool—PLANT, etc.—Ceramic Specialties Co., W. 6 St., revamping plant and installing new continuous kiln, etc., to Harrop Ceramic Service Co., 35 E. Gay St., Columbus, $50,000. Awarded 9/23.

★**Pennsylvania**—PLANT—Koppers Co., Tar and Chemical Div., N. N. Forker, vice pres. in charge, Koppers Bldg., Pittsburgh, chemical plant, synthetic rubber special chemical processing equip., storage tanks, pump house, 1 story, office bldg. Owner builds by day labor, H. B. Lose, Gen. Supt. in charge. $1,000,000.

Pa., Altoona — BAKERY — Stroehmann Bros. Co., H. J. Stroehmann, in charge, 339 Washington Blvd., Williamsport, 1 story, bsmt., 42x100 ft., brick, hollow tile, steel, bakery addn., 1414 10 St., to J. C. Orr & Son, 7 Ave. and 5 St. Est. $50,000. CD 9/18—ENR 9/21.

Pa., Danville—POWER PLANT—Sordoni Constr. Co., Forty Fort, power plant. Owner builds. $155,000. W. H. Lee, Schaff Bldg., Phila., archt. C. H. Wolfe, 112 S. 16 St., Phila., engr. Awarded 9/27.

Pa., Glenside—FACTORY—H. A. Prock, Glenside, factory, to Eastern Constr. Co., Inc., Mill Rd. and Reading R. R., $78,200. Awarded 9/22.

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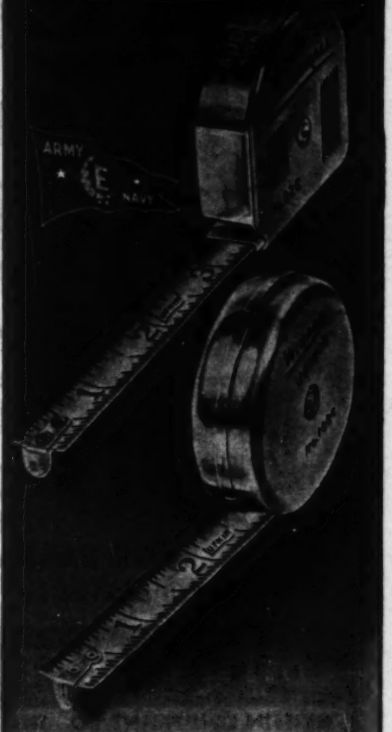

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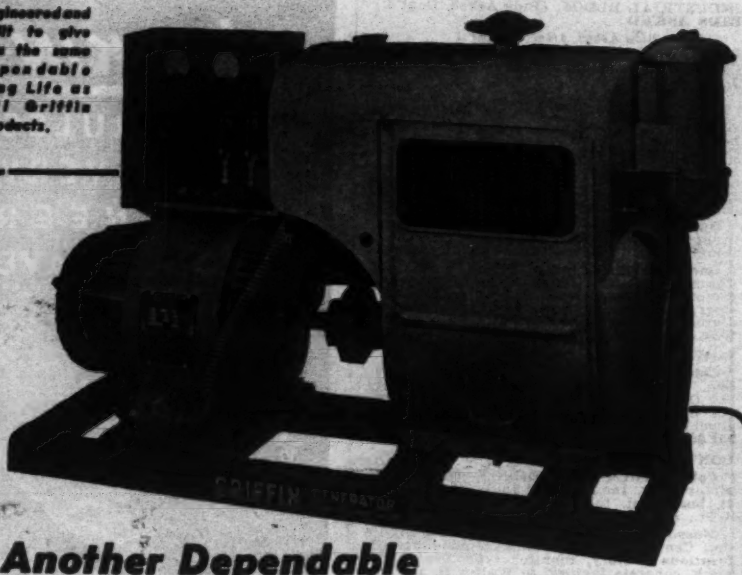

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INDUSTRIAL BLDGS. (Contracts Awar... Cont'd.)

Pa., Meadville—PLANT—David Mead ... tillery Co., M. Leff, in charge, Meadville, ... ocohol producing plant addn., alterati... brick boiler house, machinery and eq... separate contracts, $100,000. J. Brau... Leader Bldg., Cleveland, O., consult. eng...

Tex., Houston—ABATTOIR—Pauly P... ing Co., 27 N. Louisiana St., 1 story, 91 x ... ft., hollow tile, concrete abattoir, to A. M... son, 2119 Winbern St., $40,000. Awa... 9/20. CD 8/23—ENR 8/31.

Tex., San Antonio—GRAIN ELEVAT... etc.—Farmers' Grain Co., 1620 W. Comm... St., grain elevator, grain, feed and ... storage bldg., to Bird & Beecher, 321 ... Comal St., approx. $45,000.

Tex., San Antonio—WAREHOUSE—P... lee-Gaulbert Corp., 1502 S. Alamo St., 1 ... 2 story, concrete warehouse, to G. ... Mitchell, 613 Am. Hospital & Life In... $40,000. CD 9/20—ENR 9/28.

North West Territory, Yellowknife—... MOND DRILLING—Bear Exploration & ... dium, Ltd., Yellowknife, diamond drill... minimum 20,000 ft., to Boyle Bros., 6/6 ... er. Est. $200,000. CD 8/10—ENR 9/11.

★ **Ont., Hamilton**—PLANT EXTENSIO... Steel Co. of Canada, Ltd., Wilcox ... excavating for plant extension to Frid Co... Co., Ltd., 136 King St. E. Total est. a... $8,000,000 equipped. CD 8/9—ENR 8/17.

Ont., Toronto—WORKSHOP, etc.—J. ... Innes, Ltd., 1261 Bay St., 1 story, 139 x ... ft., rein.-con., structural steel, conc... block, workshop in rear of offices and sh... room, to Frontenac Const. Co. Ltd., C. P. ... Bldg., about $50,000. Marani & Morris, ... Bloor St. W., archts.

Ont., Toronto—WAREHOUSE—J. R. ... ford, purch. agt. Shell Oil Co. of Can... Ltd., 25 Adelaide St. E., 1 story, 60 x ... ft., rein.-con., brick warehouse, concrete ... to F. S. Milligan & Co., 333 Yonge St., el... $75,000. Bids 9/15. CD 9/12—ENR 9/7...

Ont., Wallaceburg — PLANT — Natio... Pressure Cooker Co. Ltd., Wallaceburg, c... crete work for plant to Frid Const. Co. L... 136 King St. E., Hamilton; structural s... work to Sarnia Bridge Co. Ltd., 361 Ca... bell St., Sarnia. Est. $50,000. CD 9/1... ENR 9/21.

Que., Lachine (Montreal)—PLANT—Bri... Rubber Co. of Canada, Ltd., 1057 Mount... St., plant, Broadway Ave. near 18 Ave.... Foundation Co. of Canada, Ltd., 1511 Bi... brooke St., Montreal. Est. $250,000-$300,...

Que., Montreal—PLANT—Canadian ... quid Air Co. Ltd., 1111 Beaver Hall H... plant addn., Reuen St., to W. G. Hunt ... Ltd., 1405 Bishop St., $40,000. CD 7/2... ENR 7/13.

Que., Shawinigan Falls—PLANT—Shaw... gan Chemicals Ltd., Transmission Ave., ... 25 x 30 ft. plant addns. and 2 bldgs., 16 x ... ft. and 60 x 61 ft., to Shawinigan Engineer... Co. Ltd., 107 Craig St. W., Montreal. $6... 000. CD 1/7—ENR 1/20.

UNCLASSIFIED

PROPOSED WORK

Arkansas—RURAL POWER LINES—... kansas Power & Light Co., Simmons Natio... Bldg., Pine Bluff, rural power line 34.5 ... Jefferson Co., $38,310; 27.2 mi. Jackson ... $22,273; 71.9 mi. Independence Co., $54,7... 14.5 mi. Chicot Co., $12,548.

†**Colo., Pueblo**—SPRINKLER SYSTE... U. S. Eng., 909 17 St., Denver, install 13... sprinkler heads in warehouses at Pue... Ordnance depot, over $300,000.

Ia., Clarinda—AIRPORT—City, A. R. ... Johnson, clk., voted $60,000 bonds, munic... airport.

Kan., Russell—AIRPORT—City, H. ... O'Brien, mayor, voted $85,000 bonds, muni... pal airport.

Ia., Charles City—AIRPORT—W. F. ... Robert, Mayor, City Hall, petitions be... signed asking that election date be set ... vote $50,000 bond issue, municipal airport.

Ia., Washington—AIRPORT—City, W. ... Fulton, clk., City Hall, petitions being sig... requesting that election date be set to v... $45,000 bond issue, municipal airport.

Ia., Winterset — AIRPORT — W. ... mayor, City Hall, petitions being signed ... ing that election date be set for $40,000 b... issue, municipal airport.

Kentucky—BRANCH LINE OR SP... Louisville & Nashville R. R. Co., C. H. Bla... man, ch. engr., 908 West Broadway, Lo... ville, Zone 1, 3.6 mi. branch or spur fr... Millport in Muhlenberg Co. to Western K... tucky coal fields, running south to reach ... coal mining properties.

La., Kenner — SUBMARINE CABLE ... Southern Bell Telephone & Telegraph C... Inc., 520 Baronne St., New Orleans, Insta... ing, maintaining submarine cable under ... across Mississippi River.

Minn., Fergus Falls—AIRPORT GRADI... —City, B. M. Lein, clk., rejected bids fo... 15, grading at municipal airport. $45,... CD 9/13—ENR 9/21.

CLASSIFIED (Proposed Work, Cont'd.)

J., Cape May — BOARDWALK — City, Hall, reconstructing 2 mi. boardwalk ...cluding frame stands on same. $150,- ... L. K. Miller, City Hall, engr.

... Y., New York—DOCK REPAIRS— ... Engineers Office, 721 Custom House, ...ring docks and ferry racks.

... Y., Voorheesville—SPRINKLER SYS- ... U. S. Engr., 120 Wall St., New York, ... 5, bids soon sprinkler sys. $50,000.

..., Roxboro—LAND BEAUTIFICATION ...wnship Council plans beautification of ...ores Bluffs, also entrances and exits of ... Twp. $40,000.

..., Weston — RECREATIONAL CEN- ...—Weston Lion's Club, c/o W. Duffy, ..., artificial enclosed ring, swimming ...ading pools, badminton and squash ...th indoor bowling alleys, etc. on 15 acre ... $75,000.

..., Youngstown—CRANE—Republic Steel ... A. McAllister, purch. agt., Republic ..., Cleveland, 10-ton double hook crane. ... $60.

...sylvania—NATURAL GAS PIPELINE, ...-Oil Div. Northern Ordnance, Inc., J. A. ..., mgr., Pleasantville, 4 in. natural gas ..., appurtenances, vicinity Trunkey- ..., Forest Co. $25,000.

..., Port Isabel—DOCKS, etc.—Valent ... Fish Co., 855 S. E. Fronton St., Browns- ...docks and fish storage facilities. Over ... Site purchased.

..., Texas City—SWIMMING POOL— ...s, J. H. McCullough, Jr., 302 2 St., 60 x ... ft., rein.-con. swimming pool, $25,000.

..., C., Vancouver—OIL DEVELOPMENT— ...ey-Vacuum Exploration Co. Inc., 1406 ...ket St., Wilmington, Del., geological and ...r exploratory work in connection with ...development. $100,000.

..., C., Victoria—AIRPORT—Municipality, ...ort at present Gordon Head military ... site. $150,000.

...S ASKED

Bids Asked After October 1

..., Berger—PIPELINE CARRIER—Phil- ... Petroleum Co., Bartlesville, Okla., lay- ...16 mi. 12 in. steel pipeline carrier (gas). ... $90.

..., Pampa—PIPELINE CARRIER—Phil- ... Petroleum Co. Bartlesville, Okla., lay- ...13 mi. 12 in. natural gas steel pipeline ... $80,000.

Bids Asked October 6

..., Phila.—WHARF—City, Dpt. P. Wks., ... Hall Annex, constructing ash wharf.

Bids Asked October 9

..., Patuxent River (br. Wash., D. C.)— ... STATION BLDG.—Yards & Docks, Navy ... 18 St. and Constitution Ave. N.W., ..., D. C., armory facilities for install- ...centrifugal gun mount devices at Naval ... Station, NOY 18897.

..., N. Y., New York—BULKHEAD SHED, etc. ...mmissioner Marine & Aviation Pier A, ... of Battery St., North River, Zone 4, ...structing north bulkhead shed, etc., ...tructing new pile platform with shed ... equipment thereon at Pier 3, North ..., Contr. 2393.

Bids Asked October 11

..., C., Esquimalt—DOCK BLDGS—Secy. ...Munitions & Supply, Ottawa, Ont., con- ...cting bldgs. Nos. 142 and 143 and exterior ... to bldg. at H. M. C. Dockyard, for Dpt. ...nal Defense (Sea), Ottawa, Ont. $50,000.

Bids Asked October 13

..., C., Parris Island—CHLORINATION ...T—Yards & Docks, Navy Dpt., 18 St. ...Constitution Ave. N.W., Wash., 25, D. C., ...ination plant for swimming pool, Spec. ..., NOY 10826.

Bids Asked October 18

..., Dell — REMOVING LIGHTING ...TMENT, etc.—Civil Aeronautics Admin., ... Tower Annex, Seattle, 4, Wash., re- ...g lighting and electrical equipment ... intermediate field and reinstalling same ...ddnl. equip. at another landing field. ... deposit $10.

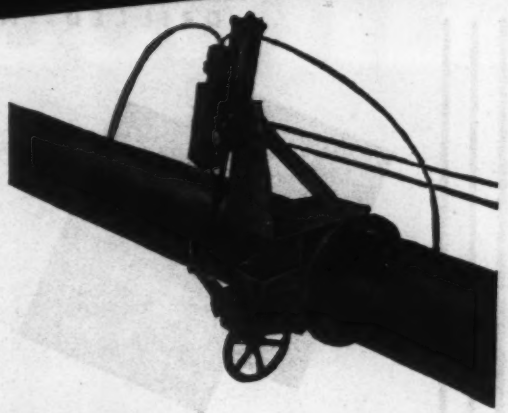
Bids Asked October 31

..., Nevada—TRANSMISSION LINE— ... Reclamation, Parker Dam, Calif., ... 140 mi. 161-kilovolt, three-phase, ...-circuit, wood-pole, H-frame-type trans- ...n line, extending from switching sta- ...at Parker Dam to Phoenix substation, ... Phoenix, Ariz., Spec. 1040.

...BIDDERS

..., Kansas—AIRPORT WORK—At office ...Purchasing Agent, City Hall, New Or- ..., Sept. 22, Proposal 4140, foundations, in- ... work for 3 hangars, outside concrete ...g adjoining hangars, constructing con- ...tower, utility, restaurant and transmit- ...dings at Moisant Airport, from R. P. ...worth & Co., Inc., 1515 S. Salcedo St., ...Orleans, $227,982. CD 9/12—ENR 9/21.

Maintain a Constant UPSTREAM or DOWNSTREAM PRESSURE



No. 501. 125-pound American Standard R-S Butterfly Valve. Declutching unit (patent applied for) permits operation of the valve with either the hand wheel or the positioner cylinder.

R S

15 to 900 psi
for air, gas, steam, liquids and semi-solids

The R-S Butterfly Valve is controlled automatically by the line pressure and is actuated by the oil or hydraulic positioner cylinder attached to the valve. If the line pressure decreases, the valve vane slowly closes until the predetermined line pressure has been reached, at which time the valve vane automatically reopens.

The dotted lines indicate the piping necessary to maintain a constant upstream pressure.

The use of an R-S Butterfly Valve as a main control valve provides unexcelled flow characteristics, simplifies performance, prevents water hammer and reduces maintenance. Operates for pressures between absolute and 900 pounds gauge. State your requirements and ask for Catalog No. 14-B.

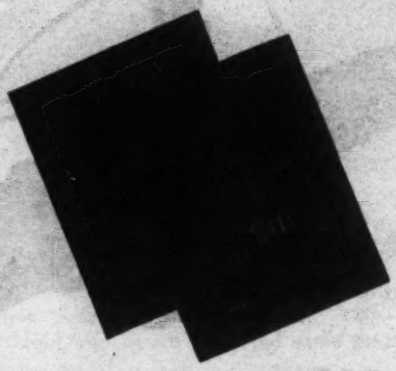
No. 529. 30-inch R-S Butterfly Valve with extension shaft for high pressure drops and heavy duty service. Only four to six revolutions of the handwheel are necessary for wedge-type closure.

VALVE DIVISION
R-S PRODUCTS CORPORATION
116 Berkley Street • Philadelphia 44, Pa.

R S Streamlined BUTTERFLY VALVES

FOUNDATIONS

PRETEST UNDERPINNING
CONCRETE-STEEL PILES
MASS CONCRETE CONSTRUCTION
HEAVY SHORING
DRILLED-IN CAISSONS



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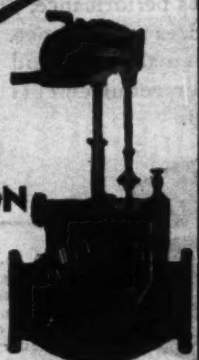
10 EAST 40th ST. NEW YORK 16, N. Y.

CONTROL WATER LEVELS WITHIN

1 inch

with the
GOLDEN-ANDERSON Float Control Valve



The G-A Float Control Valve is suitable for use on closed or open tanks, water basins, reservoirs, etc. Float Control Valves are supplied without self-contained float ball chamber if desired. Sizes available from 3" to 36". Write today for your copy of the latest G-A Catalog. It illustrates and describes the complete line.

GOLDEN-ANDERSON VALVE SPECIALTY CO.
FULTON BLDG., PITTSBURGH, PA.

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They're designed for greatest efficiency, and built to last!

Rugged all-metal sectional construction and sturdy hardware assure long years of service for Kinnear Steel RoL-TOP Doors. They can't sag, warp or pull apart. "Keystone Seal" ensures snug-fitting weather-tight closure. Ball bearing rollers and rugged heavy-duty tracks afford smooth effortless action. RoL-TOPS open upward out of the way. They're available with any number of sections paneled for glass. Made in any size to fit any doorway. Motor or manual operation. Write today for complete details. The Kinnear Mfg. Co., 1820-40 Fields Ave., Columbus 16, Ohio.

SAVING WASTE IN DOORWAYS **KINNEAR** ROLLING DOORS

UNCLASSIFIED (Low Bidders, Cont'd.)

Mass., East Boston (sta. Boston)—AIR PORT FILLING, etc.—Commonwealth Massachusetts, Dpt. P. Wks., 100 Nashua St., Boston, Sept. 26, placing approx. 19 million cu. yd. hydraulic filling in Embankment A and B, at General Edward Lawrence Logan Airport, from Gahagan Const. Corp., 90 Broad St., New York, N. Y., $3,170,000. CD 8/23—ENR 8/31.

†**Wash., Auburn**—SPRINKLER SYSTEM—U. S. Eng., 300 S Ave., Seattle 4, Sept. 19, automatic sprinkler sys. at Army Air Force warehouses, Neg. 1033, from Rushlight Automatic Sprinkler Co., 55 N.E. Farragut St., Portland, Ore., $54,444.

CONTRACTS AWARDED

California—PIPELINE—Union Oil Co., W. 7 St., Los Angeles, installing 3 mi. 1 steel pipeline between Buena Vista and Mi way, to Pacific Pipe Line Constr. Co., S. Union Ave., Bakersfield, approx. $70,000.

★†**Calif., Fairfield**—APRON, etc.—U. Eng., 1209 S St., Sacramento, Zone apron, taxiways and appurtenances at Fa field-Suisun Army Air Field, Spec. No. to Peter Kiewit Sons Co., and Johnson Everist, 442 Post St., San Francisco, $70 007. CD 8/28 under LB.

★†**Calif., Hunters Point**—BRIDGE CRA RUNWAY—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash 25, D. C., bridge crane runway, Naval Dr docks, NOY 10373, to American Bridge Commonwealth Bldg., Wash. 6, D. C., $92,535.

★†**Calif., San Diego**—AIR STATION BLDG —Yards & Docks, Navy Dpt., 18 St. Constitution Ave. N.W., Wash., completion engine overhaul shop, Air Station, NOY 9543, to Barsch Co 625 Olive St., South Los Angeles, Zone $935,000. CD 9/22, under Public Bldg LB.

†**Calif., San Leandro**—SWIMMING POO etc.—Yards & Docks, Navy Dpt., 18 St. Constitution Ave. N.W., Wash., 25, D. C swimming pool, bath house U. S. Na Hospital, Spec. 14601, NOY 10173, to Mc Donald & Kahn, Inc., Financial Center Bld San Francisco, $79,100. Bids 7/25.

Mo., St. Louis—RUNWAY REPAIRS—C M. M. Kinsey, pres. Bd. P. Service, 304 C Hall, repairing, resurfacing 4,500 ft. run at Lambert-St. Louis Municipal Airport, re resurfacing about 2,000 ft. runway, Bridges Asphalt Paving Co., 1411 Cur Industrial Dr., Zone 10, Alternate A, $71,0 Est. $35,000. Bids 9/20. CD 9/21—EN 8/31.

†**Mo., St. Louis**—ELECTRICAL WORK U. S. Eng., 316 U. S. Courthouse & Custo house, Zone 2, electrical work for electri power and lighting systems for 3 bldgs., st age yard and yard cranes, etc., Neg. No. 6 665-45-23, to Emerson-Comstock Co., 1 N. Salle St., Chicago, Ill. $220,450. Bids ad 9/20.

N. J., South River and Sayreville—G PIPELINES—Public Service Co., 80 Park Newark, two 240 ft. 8 in. steel submar gas pipelines across South River, own forc $23,000. CD 8/1—ENR 8/4.

†**N. M., Alamogordo**—AIR BASE BLDGS U. S. Eng., Albuquerque, trainer bldgs. Alamogordo Army Air Base, to J. D. Le wich, Lubbock, Tex., $31,700. Awarded 9/21

†**N. M., Clovis**—AIR BASE BLDGS— U. Eng., Albuquerque, trainer bldgs. at Cl Army Air Base, to J. D. Leftwich, Lubb Tex. $30,550. Awarded 9/29.

★†**N. Y., Idlewild**—RUNWAY PAVING Dpt. Marine & Aviation, Pier A, Nor River, New York, paving runways A, B C at Municipal Airport J Contr. 7, to A. Savin Constr. Co., 10 Village St., East Ha ford, Conn., $2,203,945. CD 9/23—ENR 9 under LB.

†**Rhode Island and Massachusetts**—HANGARS—Yards & Docks, Navy Dpt., St. and Constitution Ave. N.W., Wash., D. C., 2 steel hangars at Charlestown, at Westerly, R. I., and 2 at Martha's V yard, Mass., Spec. 13226, NOY 4577, to Turgeon, 614 Turks Head Bldg., Provide R. I., $222,484. Bids 8/26. CD 8/18.

†**Tex., Dalhart**—ELECTRIC POWER PLY SYSTEM, etc.—U. S. Eng., 416 W Bldg., Tulsa 2, Okla., electric power sup sys. for Poorman Flexible Gunnery Tr at Army Airfield, Sol. No. 34-066-45-1, Teague & Goodman Const. Co., Sher $37,581. Bids 9/1; constructing Poor Flexible Gunnery Trainer Ranges, Sol. 34-066-45-9, to Tulsa Rig, Reel & Mfg. and American Steel Derrick Co., Fidel Bldg., Tulsa, Okla., $31,000. Bids 9/4.

Tex., Montague—OIL PIPELINE—Gu Prairie Oil Co., Fair Bldg., Fort Wo 2¼ mi. 6 in. and 1¼ mi. 4 in. crude pipeline connections. Owner builds. $40 CD 8/23—ENR 8/31.

Wyoming—OIL PIPELINE, etc.—Gu Pipe Line Co., Casper, reconditioning, ping, etc., excavating and taking up 5 in. and 27 mi. 12 in. screw joint pipeline between Welch and Casper Eastern Constr. Co., Casper, $71,600; 31⅛ mi. 12 in. crude oil pipeline between Casper and Welch, to I. G. L 1403 Mercantile Bank Bldg., Dallas $143,000.

Proposal Advertisements see p. 123
Postwar Projects see p. 129

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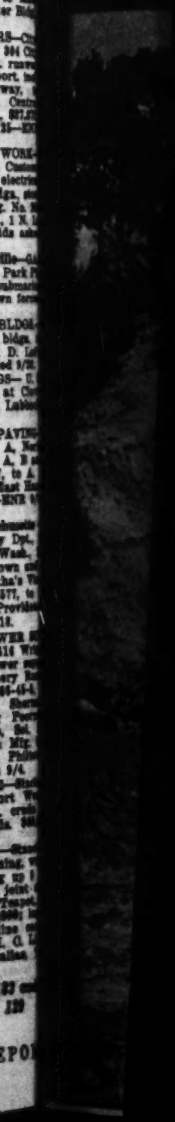
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